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ABSTRACT

Hawaii's endeavor to use information technology to improve educational practices within the state is described in four major sections: (1) the framework of the plan, including a brief history of dissemination, the goals of the plan, and philosophic statements on resources, linkages, and leadership; (2) the resource component, including an examination of databases containing knowledge resources for teachers and administrators, and an examination of services by brokers and vendors which promote access to databases and manually accessed data files; (3) the linkage component, which concerns the connection between knowledge resources and persons who could benefit from using them, and which discusses the personal attributes needed by linkers, knowledge required by linkers, and services they provide; and (4) the leadership component, which considers some of the concepts that guided the development of this plan--i.e., coordination among state agencies, creation of a supportive environment, financial support requirements, and evaluation--in the context of the three major functions of planning, supporting, and evaluating. An executive summary with recommendations concludes the report. (FM)

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THE HAWAII EDUCATIONAL DISSEMINATION DIFFUSION SYSTEM PLAN

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ABSTRACT

The Hawaii Educational Dissemination Diffusion System is an endeavor which uses information technology to improve educational practices in Hawaii. The first chapter provides the framework of the plan which includes a brief history of dissemination, the goals of the plan, and philosophic statements on resources, linkages, and leadership. In the succeeding chapters the goals and philosophic statements are transformed into objectives, reasons, and recommendations.

The second chapter concerns making knowledge resources accessible to persons concerned with improving education. Examination of teacher and administrator needs, data bases, and services by brokers and vendors, resulted in the identification of three alternatives which provide access to data bases. A cost-effective mixture of services by brokers and vendors and the development of state capacity was then selected. Recommendations on manually accessed data files are also presented.

The third chapter concerns linkage or the connection between knowledge resources and persons who could benefit by using them. Reasons and recommendations on personal attributes needed by linkers, knowledge required by linkers and services provided by linkers are made explicit. Linker services objectives are then provided in accord with the activities of spread, exchange, choice, and implementation.

The fourth chapter concerns leadership and provides reasons and recommendations on planning, supporting, and evaluating. Concepts which guided planning, coordination among state agencies, creation of a supportive environment, financial support requirements, and evaluation guidelines are included in this chapter.

The fifth chapter summarizes the plan. Recommendations are consolidated for the reader's convenience.

FOREWORD

A wise philosopher once said:

> If you are planning for 1 year, sow rice.
> If you are planning for 10 years, plant trees.
> If you are planning for 1,000 years, educate children.

This plan is about improving education for children. It involves taking advantage of the best ideas, programs, projects and materials developed through educational research.

The system presented in this plan encompasses Hawaii's directions concerning disseminating and diffusing exemplary educational practices. The reasons and recommendations on the components and activities of dissemination and diffusion represent Hawaii's commitment to cost-effective educational improvement.

Charles G. Clark
Superintendent

ACKNOWLEDGMENTS

As in any complex endeavor, this plan could not have been developed without the assistance and cooperation of many persons; it is regretable that space permits acknowledging the contributions of only a few.

The Hawaii Educational Dissemination Diffusion System Plan was developed as a result of two events: A Special Purpose Grant from the National Institute of Education and a Facilitator Contract from the United States Office of Education. Dr. Charles Haughey and Mr. Robert Chesley of the National Institute of Education provided the initial counsel and encouragement while Dr. Arch Steiner provided non-restraining guidance and support. Dr. Ed Ellis, also from the NIE, graced us with perceptive suggestions which sharpened the focus of the plan. Advice from the perspectives of the U.S. Office of Education was graciously provided by Dr. James Aven.

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The distinguished members of the Hawaii Educational Dissemination Diffusion System Task Force provided directions throughout the planning process. Their insights and suggestions are greatly appreciated. The members of the Task Force are listed separately.

We would also like to thank the many teachers and administrators whose classrooms and offices were invaded in our quest to discern the needs for dissemination and diffusion; their concerns helped in shaping this plan.

The authors of the plan are: Dr. Kellet Min, Mr. Stafford Nagatani, Ms. Kathleen Steffen, Dr. Ted Stout, Mr. Koozo Okamoto, and Ms. Claire

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The Project Director is the only person totally responsible for all that is contained herein for it is likely that none of the others would accept in full the emphasis and interpretations placed on the material in this plan. Moreover, flaws in logic, data, analyses, and the sometimes cumbersome rituals and stylistic biases are entirely the responsibility of the Project Director, Kellet Min.

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I. THE FRAMEWORK

This chapter provides the framework of the plan which includes a brief history of dissemination, the goals of the plan, and philosophic statements on resources, linkages, and leadership.

A. Brief History of Information Dissemination

The rapid dissemination of information is a novelty in history. In the thousands of years of organized societies on earth, man has survived more than 99 percent of his time without it. The invention of moveable type in the fifteenth century and the production of paper from rags perhaps best permitted information dissemination as it is thought of today because they allowed reproduction of words at a radically accelerated rate at relatively low costs.

The mythic emotion attached to heroes of printed material is part of the philosophic struggles of Western civilization: freedom of speech, of the press, of political activity. John Locke, Daniel Defoe, Jonathan Swift, John Milton, Voltaire, John Stuart Mill all fought on the borderline of political philosophy and journalism on which an independent press was founded. The right to print is enshrined in the United States Constitution.

Important to the rapid transmission of information was the delivery system. From prehistoric times to the nineteenth century, messages of substance could travel no faster than a man or horse could run. The slow rate of ground travel forced messages into the air. Carrier pigeons were increasingly used in the early nineteenth century. The top speed of pigeons was sixty miles an hour in good weather. They were faster than horses, but a major problem was that they were also more succulent.

Radio was the next major development which permitted information dissemination as it is known today. In the early 1930's, about 40 percent of American households had radios. By 1949, most American households had them. However, whereas printed materials began primarily as a medium for serious information, radio began as a medium of entertainment. Its heroes were employees who worked on an ephemeral medium

which left historians no convenient record. In contrast to the heroes of printed material, the leaders of radio were not perceived as being different from the leaders who manufactured automobiles or girdles because their leadership had to do more with finance than with philosophy. The development of radio led to the development of television.

Television was the third major development which permitted information dissemination as it is known today. In 1927, Philo T. Farnsworth, working in a darkened San Francisco apartment, transmitted television images without wires. Perhaps it was symbolic that Farnsworth used the dollar sign as a test pattern and that police raided his apartment under the impression that he was distilling intoxicants. Today, television is being used primarily as a collector of advertising dollars by selling entertainment. Even now we only dimly see its potential for the transmission of information. When combined with the computer, we are only beginning to realize that television's ultimate impact will not only be on entertainment but also on active information transactions.

The computer was the fourth major development which permitted information dissemination as it is known today. In complex industrial developments, an initial point in which nothing of relevance happened and subsequent to which it did is difficult to delineate. Certainly, the developments of print, radio, and television were significant to the development of computers. Moreover, in the early stages of a new field many novel ideas will be tried. The market place then acts to eliminate the unfit, the technological analogue of Darwin's survival of the fittest.

In 1939, an agreement was reached for a collaborative development between Harvard University and a group of International Business Machines (IBM) Corporation engineers. In August 1944, Mr. Thomas Watson, on behalf of the IBM Corporation, presented Harvard with the Automatic Sequence Controlled Calculator. Perhaps the most significant results were the IBM Corporation sensed the fundamental importance of scientific calculation to society and became convinced that the electronic approach (rather than the electromechanical digital approach) was the direction to follow.

In 1943, the Moore School of Electrical Engineering at the University of Pennsylvania and the Ordnance Department of the War Department entered into a contract to develop the Electronic Numerical Integrator and Computer (ENIAC). The ENIAC was completed on June 30, 1946, and served as the main computation device for the solution of scientific problems of the Nation. With the dedication of ENIAC, a computer revolution spread throughout the United States and Western Europe. The ENIAC was disassembled in October 1955, and parts of it are on exhibit at the Smithsonian Institution in Washington, D. C.

In 1953, IBM Corporation formally dedicated the now famous 701 Computer and launched IBM into the new world of electronic computers. Continuous improvements on computers have irreversibly altered man's life.

While tremendously useful for storage and retrieval of large amounts of information, the computer does not yet serve all dissemination needs. For example, although they can make simple talk, computers do not listen well; this often leads to a chauvinistic hypothesis on the gender of computers. Future models will, without doubt, better serve dissemination needs by understanding spoken words.

Milestones in the development of educational dissemination and diffusion include: 1) the passage of the National Defense Education Act in 1958 which was the first federal educational research authorization to contain a dissemination clause; 2) the passage of the Elementary and Secondary Education Act in 1965 which permitted local districts to develop new approaches in their own school settings; 3) the implementation in 1965 of the Educational Research Information Center which was renamed the Educational Resources Information Center (ERIC) and which was charged with acquiring processing, and storing retrievable educational information; 4) the first National Dissemination Conference sponsored by the Office of Education in 1969 which brought together representatives from state education agencies to examine dissemination efforts within state education agencies; 5) the establishment by the Office of Education in 1970 of the National Center for Education Communication which funded the Texas Education Agency to operate a project strengthening

state dissemination programs; 6) the selection of South Carolina in 1971 as the funding agent for the second phase of the National Dissemination Project; 7) the establishment by Congress in 1972 of the National Institute of Education with dissemination as one of its charges; 8) the establishment of the National Dissemination Leadership Project in the Council of Chief State School Officers in 1973; 9) the use of Elementary and Secondary Education Act, Title III, funds in 1974 to promote the diffusion of exemplary programs across state lines; 10) the initiation by the National Institute of Education in 1975 of the program to strengthen state dissemination capabilities through special purpose grants and capacity building grants; 11) the sponsorship by the National Institute of Education in 1976 of the Research and Development Utilization Program which helps schools use research and development based innovations; and 12) the emerging initiative funded by the National Institute of Education to encourage closer interactions between educational researchers and school practitioners.

In 1977, the Department of Education, State of Hawaii, received a special purpose grant from the National Institute of Education. The grant permitted development of this plan. In 1978, the Department of Education received a capacity building grant from the National Institute of Education to assist the implementation of the Hawaii Educational Dissemination Diffusion System; the Department also received a contract to diffuse Educational Programs That Work from the U.S. Office of Education.

In 1979, we are on the threshold of changes in human communications more significant than the sum of all past developments in the technology of information. This plan is a modest attempt to use past developments in fostering changes and to take advantage of present and future information technology to improve education in Hawaii.

B. The Goals of the Plan and the Activities of Dissemination and Diffusion

A discussion of the major terms used in this plan may be helpful at this juncture. Dissemination isn't what it sounds like; it can be practiced among all consenting adult educators. Dissemination involves supplying persons with research and development information and assist-

ing them to use it in order to improve educational practices; the major impetus comes from the National Institute of Education. Diffusion involves a more specific effort of making Educational Programs That Work available to educators and assisting them to adopt and adapt them to improve educational practices; Educational Programs That Work are programs which were developed by local school districts and which have been validated by a Joint Dissemination Review Panel comprised of members of the National Institute of Education and the U. S. Office of Education; the major national impetus comes from the U. S. Office of Education.

A major goal of this plan is to foster a common understanding of dissemination and diffusion in Hawaii by describing the Hawaii Educational Dissemination Diffusion System. Another major goal of the plan is to provide recommendations on the components of dissemination and diffusion. Dissemination and diffusion components include: making information resources accessible; providing linkages to the information resources; and providing leadership in dissemination and diffusion activities. The outcomes of dissemination and diffusion are varied and range from acquiring knowledge for its own sake, to using information to maintain existing practices, to making improvements in educational practices. Dissemination and diffusion assist in decreasing educational distances from Hawaii to other parts of the world and in decreasing the isolation of rural island communities through the use of cumulative knowledge and experiences of others.

Dissemination and diffusion activities include: 1) spread, which is the one way casting out of knowledge in all its forms such as ideas, programs, projects, practices, and materials; 2) exchange, which is the two-way or multi-way flow of ideas, programs, projects, practices, and materials as to needs, problems, and potential solutions; 3) choice, which is the facilitation of rational consideration and selection among ideas, programs, projects, practices, and materials from educational research and development that can be used to improve education; and 4) implementation, which is the adoption and adaption of improvements.

C. The Resource Component

The resource component of the Hawaii Educational Dissemination Diffusion System encompasses making ideas, programs, projects, practices, and materials available to educational practitioners such as teachers and principals. In addition to educational practitioners, educational resources should be made available to natural linkers such as State and district educational specialists, to key decision-makers such as legislators and school board members, and to citizen groups involved with improving education.

First, the needs of Hawaii's educators should be identified. Next, available data bases which contain knowledge resources should be examined for applicability to needs. Third, services by brokers and vendors which promote access to data bases should be examined. Analyses should then determine a cost-effective mixture of services which promote access to data bases containing knowledge resources.

An ideal resource component also includes manually accessed data files which should be made available to persons in Hawaii concerned with improving education. These manually accessed data files include national files, regional files, and the State promising practices file.

In sum, an ideal resource component would make knowledge resources accessible through an effective and efficient mixture of national and local knowledge resources, commercial and state capacities, and computerized data bases and manually accessed data files. The goal of the resource component is to prevent expensive reinventions of ineffective wheels.

D. The Linkage Component

Generally, linkage is the connection between knowledge resources and persons who could benefit from using them. It involves providing human assistance in searching, interpreting, and using resources to improve educational practices. Assistance is necessary because resource systems are specialized, fragmented, and complex; the use of computer systems, for instance, requires specialized knowledge.

In order to assist persons in applying information to improve education, linkers should possess personal attributes which support linker services. These personal attributes should be made explicit. The relevant assumptions and advantages of change models should be identified and presented for linkers' consideration. Services expected of linkers should be made explicit and service objectives should be set. Linker skills categorized under spread, exchange, choice and implementation services should also be delineated. Employing these skills should dispel the old adage among horses: you can throw your rider into the water but you cannot make him drink. In other words, the goal of linking is drinking.

The approaches for delivering linker services within the organizational context of Hawaii should be examined and an approach selected. Linker services ideally should be made available to educational practitioners such as teachers and principals, to natural linkers such as State and district educational specialists, to educational decision-makers such as legislators and members of the State Board of Education, and to citizen groups such as the Hawaii State Department of Education Affirmative Action Advisory Council. Human informational services to these groups are expected to increase their capabilities to influence improvements in educational practices.

E. The Leadership Component

Leadership may be thought of as encompassing three major functions: 1) planning, 2) supporting, and 3) evaluating. A major annoyance is that exercise of these functions often causes leaders who turn around to discover they are not leading but are being chased.

Planning helps to prevent leaders from being caught. It involves avoiding unfortunate eventualities by selecting objectives which lead to the kinds of futures that are desired. The ideal plan contains goal or philosophic statements, establishes objectives, provides indicators of objective accomplishment, considers alternatives to accomplishing objectives, evaluates alternatives, and produces recommendations for future actions which include costs. In order to develop such a plan, collaboration is needed among personnel of agencies who

have interests in dissemination and diffusion; accordingly, a statewide ad hoc advisory group should be convened to provide directions and to coordinate services.

The second function of leadership is supporting. Because the Hawaii Educational Dissemination Diffusion System operates within the larger framework of the Hawaii State education system, the plan needs to address supporting actions of key leaders in the state education system as well as supporting actions of key personnel within the dissemination system. Supporting actions of key personnel in the state system include communicating support for the objectives and activities of dissemination and diffusion, providing financial support, providing an environment where persons are rewarded for risking changes, and sustaining the capacity to disseminate and diffuse through institutionalization, i.e., making the use of knowledge resources a permanent feature of the Department. Supporting actions of key personnel within the dissemination system involves conducting daily operations in accord with the leadership functions of this plan. These include making recommendations on revising this plan, appraising personnel and arranging for training, coordinating daily services, and evaluating services.

The third leadership function is evaluating. The essence of this function is determining whether or not objectives are being accomplished. Forward looking controls should be used. The system should provide monitoring of objective accomplishments to see if the Hawaii Educational Dissemination Diffusion System is on course, and to provide information by which problems can be anticipated and actions taken to prevent them from occurring. The goal is making the intended occur. To this end, budgets, statistical data, indicators of objective accomplishment, and data from personal observations should be analyzed and acted upon.

In sum, the goal of leadership is creating an environment in which individuals can work together to accomplish group goals. In other words, leadership is planning for everything, overlooking a lot, and correcting a little.

II. THE RESOURCE COMPONENT

A. The Framework

In this plan, the resource component consists of data bases which contain knowledge resources and services which promote access to data bases. Knowledge resources include ideas contained in journals, programs developed by research centers, exemplary projects developed by local school districts, and materials developed by commercial corporations. Data bases are groupings of knowledge resources such as *Psychological Abstracts* and *Exceptional Child Education Resources*. Services which promote access to data bases are provided by brokers of information such as the San Mateo Educational Resources Center, County of San Mateo, California; and vendors of information such as DIALOG, the Lockheed Missiles and Space Company, Incorporated.

This chapter provides reasons for recommendations on data bases which will be made available to persons in Hawaii concerned with improving education. It also provides reasons for recommendations on services from brokers and vendors which promote access to data bases and recommendations on manually accessed data files.

B. Data Bases Containing Knowledge Resources

The objectives of this section are: 1) to identify needs for knowledge resources and, 2) to identify applicable data bases which should be made available to persons concerned with improving education. The indicators of objective accomplishment are: 1) the inclusion in this plan of needs which guided selection of data bases and 2) the inclusion of this plan of data bases which should be made available.

The methodology to identify needs consisted of interviewing a sample of public school administrators and teachers. Data bases which fulfill needs are then identified.

1. Knowledge Resources Needs

Planning efforts are often characterized by too much dreaming, too much talking, and too little listening. A special

purpose award by the National Institute of Education permitted listening to a statewide sample of 120 administrators and teachers concerning their needs for knowledge resources. Three questions relating to needs for knowledge resources were asked during preparation for this plan. The first question was, "Is information accessible?" Of the 120 administrators and teachers interviewed, 102 persons had responses regarding information accessibility:

- 16 persons or 16 percent - accessible
- 42 persons or 41 percent - partly accessible
- 44 persons or 43 percent - not accessible, especially to the neighbor islands

The second question was, "What kinds of information are needed?" Of the 120 administrators and teachers interviewed, 126 responses on information needs were given:

- 1 response or 1 percent - slow learners
- 1 response or 1 percent - dropouts
- 1 response or 1 percent - library skills
- 1 response or 1 percent - food services
- 2 responses or 2 percent - vandalism
- 2 responses or 2 percent - values education
- 2 responses or 2 percent - energy utilization
- 2 responses or 2 percent - high interest materials
- 2 responses or 2 percent - specific lesson plans
- 2 responses or 2 percent - student martial arts
- 4 responses or 3 percent - English as a second language
- 4 responses or 3 percent - evaluation
- 4 responses or 3 percent - successful practices
- 4 responses or 3 percent - basic research
- 4 responses or 3 percent - math for slow learners
- 4 responses or 3 percent - vocational education for handicapped children
- 6 responses or 4 percent - gifted and talented programs
- 6 responses or 5 percent - all areas
- 8 responses or 6 percent - Hawaiian history
- 8 responses or 6 percent - vocational education
- 10 responses or 8 percent - reading
- 10 responses or 8 percent - accountability
- 12 responses or 9 percent - basic skills
- 12 responses or 9 percent - special education
- 14 responses or 11 percent - competency based testing

The third question relating to administrators and teachers needs for knowledge resources was, "What are potential sources of information?" Of the 120 administrators and teachers interviewed, 93 responses about sources were given:

- 1 response or 1 percent - Office of Vocational Education
- 1 response or 1 percent - Association for Supervision and Curriculum Development
- 1 response or 1 percent - Elementary and Secondary Education Act Bulletin
- 1 response or 1 percent - National Information Center for Special Education Materials/National Instructional Materials Information System
- 1 response or 1 percent - Special Education Information Center
- 1 response or 1 percent - Dissertation Abstracts
- 1 response or 1 percent - public agencies
- 1 response or 1 percent - National Diffusion Network
- 1 response or 1 percent - friends
- 2 responses or 2 percent - resource persons
- 2 responses or 2 percent - publications
- 2 responses or 2 percent - local experts
- 4 responses or 4 percent - Career Information Center of the University of Hawaii
- 4 responses or 4 percent - Office of Instructional Services, Hawaii State Department of Education
- 4 responses or 4 percent - district guides
- 4 responses or 4 percent - Education Resources Information Center
- 6 responses or 7 percent - State Office
- 7 responses or 8 percent - other districts
- 8 responses or 9 percent - journals and magazines
- 10 responses or 11 percent - community professionals
- 10 responses or 11 percent - other teachers
- 20 responses or 22 percent - libraries

Responses to the questions disclosed that administrators and teachers felt they did not have access to knowledge resources. Information is generally obtained through individualistic approaches such as going to libraries, asking other teachers, and seeking experts. While the kinds of information needed are varied, it appears that, for the most part, teachers and administrators do not have specific knowledge on obtaining resources. In short, knowledge resources need to be made available, and administrators and teachers need to be informed of the knowledge resources available to them, and they need to be informed of the procedures to obtain knowledge resources.

2. Data Bases Which Should Be Made Available

Data bases are like bikinis: they both reveal a lot and cover strategic areas. Strategic areas relevant to persons concerned with improving education are covered in such bases[1] as:

a. *The Abstracts of Instructional Materials/Abstracts of Research Materials* (AIM/ARM) data bases, the Center for Vocational Education, the Ohio State University. This data base consists of documents on all aspects and subfields of vocational and technical education and the related areas of manpower, employment, job training, and vocational guidance. Resources in the following subject areas are included: agricultural education, business and office education, consumer education, distributive education, health occupations education, home economics education, industrial arts education, manpower economics, occupational guidance, occupational rehabilitation, and trade and industrial education. Types of resources include: abstracts of instructional materials developed by local school districts, state departments of education, curriculum laboratories, and commercial organizations; and research from the U.S. Office of Education, Department of Labor, Office of Economic Opportunity, private foundations, and other organizations. The size of this data base is 17,500 citations as of February, 1978.

b. *The Agriculture On Line Access* (AGRICOLA) data base, U.S. Department of Agriculture. This data base provides comprehensive coverage of worldwide publications in agriculture and related fields. Resources in the following subject areas are included: agricultural economics, agricultural engineering, agricultural products, agriculture in general, animal industries, botany, chemistry, energy in agriculture, entomology, fertilizers, foods, forestry, human nutrition, hydroponics, pesticides, plant sciences, pollution, rural sociology, soils, veterinary medicine, and water management. Types of resources include: pamphlets, government documents, research reports, conference proceedings, and translations. The size of this data base is 1,000,000 citations as of April, 1978.

c. *America: History and Life* (AHL), ABC-Clio, Inc. This data base consists of the full range of U. S. and Canadian history, area studies, and current affairs. Resources on the following

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[1] James V. Bina, John C. Peterson and Ida Marie Halasz, Databases and Clearinghouses: Information Resources for Education, (Columbus, Ohio: The Resource and Referral Service, The Research and Development Exchange, the National Center for Research in Vocational Education, The Ohio State University, 1978).

areas are emphasized: American studies, cultural history, economic history, ethnic studies, family history and women's studies, folklore, history, history of ideas, historiography and methodology, international relations, local history, military history, oral history, prehistory, politics and government, popular culture, religious history, history of science and medicine, teaching of history, and urban affairs. Types of resources include abstracts, special interest journals, books, and book reviews. The size of this data base is 42,500 citations as of February, 1978.

d. *American Statistical Index* (ASI), Congressional Information Services, Inc. This data base covers all U.S. Government significant statistical information. Resources in the following subject areas are included: documents of the Bureau of the Census, Bureau of Labor Statistics, National Center for Educational Statistics. The size of this data base is 55,000 records as of February, 1978.

e. *Comprehensive Dissertation Abstracts*, University Microfilms International. This data base consists of approximately 99 percent of all American dissertations. Resources in all subject areas are covered. Types of resources included are subject, title and author guide to every American dissertation accepted at an accredited institution since 1861, when doctoral degrees were first granted in the United States. The size of this data base is over 600,000 citations as of February, 1978.

f. *Exceptional Child Education Resources* (ECER), The Council for Exceptional Children. This data base consists of published and unpublished literature on the education of handicapped and gifted children. Resources include all aspects of the education of handicapped and gifted children. Types of resources include: books, monographs, literature guides, legislative documents, journal articles, administrative policy manuals, newsletters, curriculum guides, program descriptions, teaching guides, research reports, conference reports, pamphlets, and non-print media. This size of this data base is 24,000 citations as of January, 1978.

g. *Congressional Information Service Index* (CIS), Congressional Information Service, Inc. This data base covers U.S. legislation and government operations; it covers the full range of issues and topics of legislative concern. It does not cover information that is in the Congressional Record. Types of resources include: U.S. Congressional hearings reports, Committee Prints and other studies. The size of this data base is 90,000 items as of February, 1978.

h. *ENERGYLINE*, Environment Information Center, Inc. This data base provides information on: U. S. economics, U. S. policy and planning, international economics, policy and planning, research and development, resources and reserves, petroleum and national gas resources, coal resources, unconventional resources, solar energy, fuel processing, fuel transportation and storage, electric power generation, electric power storage and transmission, nuclear resources and power, thermal nuclear power, consumation and conservation, industrial consumption, transportation consumption, residential consumption, energy environmental impact. Resources include: scientific, technical, trade, and general periodicals; proceedings of major symposiums and conferences; technical and research reports; official government documents and reports. The size of this data base is 18,000 items as of February, 1978.

i. *ENVIROLINE*, Environment Information Center, Inc. This data base provides coverage of air, noise, and water pollution, food and drugs, chemical and biological contamination, wildlife, land use, environmental education and design, population planning and control, energy, resources, transportation, solid wastes, and weather modification. Resources include: scientific, technical, trade, and general periodicals, proceedings of major symposiums and conferences; technical and research reports; official government documents and reports; national newspapers. The size of this data base is 65,000 items as of February, 1978.

j. The *Educational Resources Information Center* (ERIC) data base, National Institute of Education. This data base consists of the most significant and timely educational reports and an index of more than 700 journals in education. Resources in the following subject areas are included: career education, counseling and personnel services, early childhood education, educational management, handicapped and gifted children, higher education, information resources, junior colleges, languages and linguistics, reading and communication skills, rural education and small schools, science and environmental education, mathematics, social studies and social science education, teacher education, tests and evaluation, and urban education. Types of resources include: research reports, evaluation studies, curriculum guides, lesson plans, bibliographies, course descriptions, theses, journal articles and pamphlets. The size of this data base is 302,000 citations as of June, 1978.

k. *Foundation Grants Index*, The Foundation Center. This data base consists of information on grants awarded by more than 400 major American philanthropic foundations. Information in the following fields is included: education, health, welfare, sciences, international activities, humanities, and

religion. Grants to individuals and grants of less than $5,000 are not included. The size of this data base is 50,000 records as of January, 1978

l. *Grant Information System* (GIS). This data base lists grants available from federal, state and local governments, and from public and private foundations and non-foundation corporations. All funders in 90 academic disciplines are covered. Resources include grants and future grant information published by foundations, federal, state, and local governments, and non-foundation corporations. The size of this data base is 2,000 programs as of March, 1978.

m. *Historical Abstracts*, ABC-Clio, Inc. This data base consists of abstracts and indexes to the periodical literature in history and related social sciences and humanities. Resources in the following subject areas are included: area studies, cultural history, diplomatic history, economic history, historiography and methodology, history of science and medicine, intellectual history, international relations, military history, philosophy of history, political history, social history, social sciences with historical perspectives, and teaching of history. Types of resources include: abstracts, essays, and papers. The size of this data base is 47,000 citations as of March, 1978.

n. *Language and Language Behavior Abstracts* (LLBA), Sociological Abstracts, Inc. This data base covers anthropological linguistics, applied linguistics, descriptive linguistics, discourse analysis/test linguistics, hearing-pathological and normal, hearing and speech physiology, history of linguistics, interpersonal behavior and communication, language-pathological and normal, and learning disabilities. Resources include: 1200 foreign and domestic journals, abstracts of book reviews, and abstracts of papers presented at conferences. The size of this data base is 23,000 items as of January, 1978.

o. *Management Contents Data Base* (MANAGEMENT), Saresta Rosenberg, Management Contacts, Inc. This data base covers U. S. and non-U. S. business literature. Subjects include accounting, banking, commodities and goods, economics, finance, government regulations, human resource development, industrial relations, management, marketing, production, professions, public administration and government, social issues, systems and controls, and industry specific literature. Resources include 210 journals, periodicals, conference proceedings and transactions. The size of this data base is 35,000 items as of January, 1978.

p. *Child Abuse and Neglect* (NCCAN). This data base covers all areas of child abuse and neglect. Resources include published materials only. The size of this data base is 4,500 citations as of March, 1978.

q. *The National Information Center for Educational Media* (NICEM), National Information Center for Educational Media. This data base consists of non-print media covering from preschool to post-graduate level materials in all academic areas. Resources are heavily covered in the following subjects: psychology, vocational and technical education, health and safety education, and environmental studies. Types of resources include: 16mm films, 35mm filmstrips, overhead transparencies, video-tapes, audio tapes, phonograph records, 8mm motion cartridges, and slides. The size of this data base is 500,000 citations as of January, 1978

r. *National Information Center for Special Education Materials/ National Instructional Materials Information System I* (NICSEM/NIMIS I) This data base covers subject areas such as visual, hearing, speech and language impairments, mental retardation, behavior disorders, learning and physical disabilities. Resources include: print and non-print materials such as books, guides and manuals, kits, films, video and audio cassettes, filmstrips, games, toys, and transparencies. The size of this data base is 37,000 items as of February, 1978.

s. *The National Technical Information Service* (NTIS, U. S. Department of Commerce. This data base consists of government-sponsored research, development, and engineering reports as well as journal articles and translations. The following subject areas are included: administration, aeronautics and aerodynamics, agriculture and food, astronomy and astrophysics, atmospheric sciences, behavior and society, biomedical technology and engineering, building technology, business and economics, chemistry, civil engineering, communication, computers and information theory, electrotechnology, energy, environmental pollution and control, health planning, industrial and mechanical engineering, library and information sciences, materials sciences, mathematical sciences, medicine and biology, military sciences, national resources and earth sciences, navigation and control, nuclear science and technology, ocean technology and engineering, physics, space technology, transportation, urban and regional technology. The major type of resources is reports of 300 federal government agencies. The size of this data base is 580,000 citations as of January, 1978.

t. *Psychological Abstracts*, American Psychological Association. This data base covers the world's literature in psychology and related disciplines such as psychology, sociology, anthro-

pology, education, pharmacology, physiology and linguistics. Resources in the following subject areas are included: applied psychology, communication systems, developmental psychology, educational psychology, experimental human psychology, experimental animal psychology, experimental social psychology, general psychology, personality, physical and psychological disorders, physiological intervention, physiological psychology, professional personal and issues, psychometrics, social processes and issues, and treatment and prevention. The major type of resources are periodicals, technical reports, monographs, books, and dissertation abstracts/technical. The size of the data base is 240,000 citations as of February, 1978.

u. *Sociological Abstracts* (SA), Sociological Abstracts, Inc. This data base covers the world's literature in sociology and related disciplines in such subject areas as methodology, research technology, history and theory, social psychology, culture and social structure, management and complex organizations, social change, economic development, mass phenomena, political interactions, stratification, rural and urban sociology, feminist studies, poverty studies, sociology of the family, arts, knowledge, religion, and science. Resources include: 130 core journals abstracted in total; 1200 journals screened; abstracts of papers at sociology meetings. The size of this data base is 83,000 items as of January, 1978.

v. *Social Scisearch* (SSCI). This data base covers every area of the social and behavioral sciences. Subject areas include: anthropology, archaeology, area studies, business, finance, communications, health, criminology, demography, economics, education, ethnic groups, geography, history, information, international relations, law, linguistics, management, marketing, philosophy, political science, psychology, psychiatry, sociology, statistics, and urban development. Resources include 1500 journals. The size of this data base is 500,000 citations as of February, 1978.

w. *The San Mateo Education Resources Center* (SMERC), San Mateo County Office of Education, California. This data base provides: SMERC's own collection of documents which have been determined to be of interest to educators, but which are not found in other known collections of educational materials; learning center packages which are programs designed by teachers to provide for different learning patterns of students, to lead them to assume the responsibility of solving problems through explanation, and to offer the opportunity for success at the learner's level of achievement; the California Curriculum Guide Collection; Career education/career awareness materials collected by the California State Department of Education. The size of this data base is approximately 11,100 items as of November, 1978.

x. *Clearinghouses.* The following are central agencies which collect, classify, and distribute information:

1) *Clearinghouse for Adult Education and Lifelong Learning* (ADELL). This clearinghouse links the adult education community with pertinent adult education knowledge resources.
2) *Clearinghouse on Applied Performance Testing* (CAPT). This clearinghouse provides clients with rapid accessibility to applied performance testing, devices, procedures, and relevant knowledge resources.
3) *Clearinghouse on Women's Studies.* This clearinghouse facilitates clients' access to appropriate knowledge resources (services, materials, and organizations) in the women's studies area.
4) *Clearinghouse on the Handicapped.* This clearinghouse furnishes knowledge resources for all handicapped individuals, educational practitioners, and interested public.
5) *Clearinghouse--Resources for Educators of Adults* (CREA). This clearinghouse organizes the identification, acquisition, and dissemination of knowledge resources for educational practitioners of adults.
6) *National Clearinghouse for Bilingual Education.* This clearinghouse services the needs of the bilingual education community for knowledge resources.
7) *National Nutrition Education Clearinghouse* (NNECH). This clearinghouse collects, evaluates, and catalogs nutrition education materials for clients' use.
8) *Women's Educational Equity Communications Network* (WEECN). This clearinghouse supplies knowledge resources such as educational equity, non-sexist educational materials, vocational and career opportunities, physical education, educational administration, and guidance and counseling to clients.

3. Recommendations

a. It is recommended that a cost-effective mixture of the following data bases be made available to persons concerned with improving education in Hawaii (The selection of specific data bases is included in the recommendations on services which promote access to data bases presented in the next section):

- *Abstracts of Instructional Materials/Abstracts of Research Materials Vocational File*
- *Agriculture On Line Access*
- *America: History and Life*
- *American Statistical Index*
- *Comprehensive Dissertation Abstracts*

- *Exceptional Child Education Resources*
- *Congressional Information Service Index*
- *ENERGYLINE*
- *ENVIROLINE*
- *Educational Resources Information Center*
- *Foundation Grants Index*
- *Grants Information System*
- *Historical Abstracts*
- *Language and Language Behavior Abstracts*
- *Management Contents Data Base*
- *Child Abuse and Neglect*
- *National Information Center for Educational Media*
- *National Information Center for Special Education*
- *Materials/National Instructional Materials Information System I*
- *National Technical Information Service*
- *Psychological Abstracts*
- *Sociological Abstracts*
- *Social Scisearch*
- *San Mateo Educational Resources Center*
- *Clearinghouses*

b. It is recommended that available data bases be vigorously publicized by the Hawaii Educational Dissemination Diffusion System so that persons concerned with improving education become more aware of knowledge resources available to them.

C. Services by Brokers and Vendors Which Promote Access to Data Bases and Manually Accessed Data Files

The objectives of this section of the plan are: 1) to select services by brokers and vendors which promote access to data bases containing knowledge resources and 2) to select manually accessed data files. The indicators of objective accomplishment are: 1) the inclusion in this plan of recommendations concerning services and computer data bases which provide the best mixture of data bases applicable to persons concerned with improving education, and 2) the inclusion in this plan of recommendations concerning manually accessed data files applicable to persons concerned with improving education in Hawaii.

The methodology used to accomplish the objectives of this section include: 1) examining four services by brokers and vendors which promote access to data bases containing knowledge resources for capabilities to provide bibliographic lists and abstracts, and

to provide staff services and microfiche and/or photocopies of selected resources thought to be of particular relevance to clients; 2) identifying alternative ways of making data bases accessible to persons concerned with improving education; 3) selecting a cost-effective mixture of services which promote access to data bases containing knowledge resources; and 4) selecting manually accessed data files.

1. Services by Brokers and Vendors Which Promote Access to Data Bases

The Industrial Revolution resulted in replacing manual labor with machines. Today, a similar revolution is taking place in which brain labor is being replaced by computers. In other words, the intent is "not to work harder but smarter."

a. Examination of Four Services by Brokers and Vendors Which Promote Access to Data Bases

Four services by brokers and vendors which promote access to data bases containing knowledge resources were examined for capabilities to provide bibliographic lists and abstracts, and to provide staff services and microfiche and/or photocopies of selected references thought to be of particular relevance to clients. This examination was permitted by a special purpose grant by the National Institute of Education. The four services were: 1) ORBIT Search Service, the System Development Corporation; 2) DIALOG Information Retrieval Services, Lockheed Missiles and Space Company, Inc.; 3) Library Information Services, Honolulu, Hawaii; and 4) San Mateo Educational Resources Center, County of San Mateo, Office of Education, California.

The first service by a vendor which was examined was ORBIT, the information retrieval service of the System Development Corporation. This service offers on-line searching. On-line searches permit interaction between the searcher and the computer and allows immediate feedback of the results and modification of the search request when

desired. Searches are conducted through the use of a terminal, the device which permits interaction with the computer; a printer provides bibliographic lists and abstracts. This service contains the following data bases related to education: *Agriculture on Line Access, American Statistical Index, Comprehensive Dissertation Abstracts, Congressional Information Service Index, ENERGYLINE, ENVIROLINE, Educational Resource Information Center, Foundation Grants Index, Grant Information System, Management Contents, National Technical Information Services, and Psychologial Abstracts.*

The second service by a vendor was DIALOG, the information retrieval service of the Lockheed Missiles and Space Company, Incorporated. This service offers on-line searching. On-line searches permit interaction between the searcher and the computer and allows immediate feedback of the results and modification of the search request when desired. Searches are conducted through the use of a terminal, the device which permits interaction with the computer; a printer provides bibliographic lists and abstracts. This service contains the following data bases related to education: *Agriculture On Line Access, America: History and Life, Abstracts of Instructional Material/Abstracts of Research Materials, Comprehensive Dissertation Abstracts, Exceptional Child Education Resources, ENERGYLINE, ENVIROLINE, Educational Resources Information Center, Foundation Grants Index, Historical Abstracts, Language and Language Behavior Abstracts, Management Contents, Child Abuse and Neglect, National Information Center for Educational Media, National Information Center for Special Education Materials/ National Instructional Materials Information System I, National Technical Information Service, Psychological Abstracts, Sociological Abstracts, and Social Scisearch.*

The third service by a broker of information which was examined, was Library Information Services located in Honolulu, Hawaii. This service is provided by "free lance librarians" who search for literature relevant to clients' needs. Searchers use the data bases of System Development Corporation, the data bases of the Lockheed Missiles and Space Company, Incorporated, and applicable manually accessed data files. The search procedure includes going to primary sources such as authorities and agencies which generate the data. Services include delivery of bibliographic lists and abstracts, and microfiche and/or photocopies of relevant materials.

The fourth service by a broker of information which was examined, was the San Mateo Educational Resources Center. This service is provided by researchers who search for literature relevant to clients' needs. Contact with researchers is made via the telephone or in writing. Searchers use the following data bases: *Educational Resources Information Center, Fugitive Information Data Organizer, Training Center Packages, the California Curriculum Guide Collection, the Career Education Collection, and DIALOG.* This service includes delivery of bibliographic lists and abstracts, and staff services and microfiche and/or photocopies of selected resources.

A cursory examination of the four organized computer data bases of the four services by brokers and vendors reveals common files and capabilities. Thus, it would be uneconomical to employ all four services in the Department of Education. When the four services are examined for capabilities to provide bibliographic lists and abstracts, and staff services and microfiche and/or photocopies of selected resources, several combinations can be readily identified. These combinations are arrayed on Table I.

Table I

Combinations of Services Which Provide Bibliographic Lists and Abstracts, and Staff Services and Microfiche and/or Photocopies of Selected References

Combinations	Bibliographic Lists and Abstracts	Staff Services and Microfiche and/or Photocopies
1. SMERC	X	X
2. SMERC & DIALOG	X	X
3. SMERC & ORBIT	X	X
4. SMERC & LIS	X	X
5. DIALOG & SDC	X	
6. DIALOG & LIS	X	X
7. LIS & SDC	X	X

Table I discloses that six combinations can provide the capabilities desired. The combination of two services such as SMERC and DIALOG refers to their selective use. In general, linkers of the Hawaii Educational Dissemination Diffusion System would perform searches resulting in a computer printout of bibliographic lists and abstracts. Clients would then order microfiche and/or photocopies from the computer printout which would be supplied through the San Mateo Educational Resources Center. If a client requests a search which would include an examination of the printout by trained researchers who would include relevant microfiche and/or photocopies in the search package, the request would be referred to San Mateo Educational Resources Center. Combinations

using services such as SMERC and DIALOG and ORBIT would use similar data bases; thus, only combinations of two services are arrayed.

In pilot testing of Library Information Services, it was observed that although the Company could provide bibliographic lists and abstracts within a reasonable time, microfiche and/or photocopies could neither be provided within the Hawaii Educational Dissemination Diffusion System budget constraints nor within a reasonable time.

Thus, three major alternatives providing access to data bases can be identified as: 1) contracting for all searches for knowledge resources and delivery of resources with the San Mateo Educational Resources Center, 2) developing the capacity of the Department of Education to provide searches for knowledge resources and delivery of resources, and 3) combining contractual services (i.e., SMERC & DIALOG, SMERC & ORBIT, or SMERC & LIS) with the development of some Departmental capacity to provide searches for knowledge resources and delivery of resources.

b. Evaluating Alternative Ways of Providing Access to Data Bases

The first alternative is contracting for all searches for knowledge resources and delivery of resources with the San Mateo Educational Resources Center. This involves submitting all requests for knowledge resources to the San Mateo Educational Resources Center. Results of requests would include bibliographic lists and abstracts, staff services and microfiche and/or photocopies of selected references. The estimated costs of services per year are based on student enrollment and are as follows:

Public school enrollment	170,000	
Private School enrollment	35,000	
Total Enrollment	205,000	
Estimated search services cost per pupil	x.16	
Search services cost		$32,800
Estimated costs of microfiche and/or photocopies	$4,000	
Costs per annum		$36,800

The advantages of this alternative are: the Department would not have to establish access to data bases; searches for knowledge resources could begin immediately upon concluding a contract; the alternative is least costly; and little expertise is required in the areas of storage and retrieval of knowledge resources.

The disadvantages of this alternative are: no development of a long-range capacity to provide knowledge resources search services would take place; search services turnaround time would be completely dependent upon mail delivery; and the Department would be dependent on services dependent upon events in California.

The second alternative to providing access to knowledge resources is developing the Department's capability to provide searches for knowledge resources and delivery of resources. This involves providing clients with bibliographic lists and abstracts, and staff services and microfiche and/or photocopies of selected references. This alternative includes purchasing materials, contracting to obtain data bases, developing computer programs which provide access to data bases, services which promote access to knowledge resources. The estimated cost of developing the Department's capabilities are:

Resources

Educational Resources Information Center		
Current Index to Journals in Education (750 journals)	$50,000	
Resources in Education (microfiche collection)	2,000	
Professional books (500/yr. at $15)	7,500	
General reference books (50/yr. at $20)	1,000	
Sub total		$60,500

Staff to Maintain Resources

Librarian IV (SR26B)	$17,088	
Library Assistant III (SR07B)	14,544	
Fringe Benefits (21.2%)	6,706	
Sub total		$38,338

Staff for Computer Data System Which Provides Access to Data Bases

Institutional Analyst II (E06-1)	$ 17,612	
Data Processing Systems Analyst III (SR21B)	13,572	
Research Analyst/Linker (SR21B) (4 x 13,572)	54,288	
Reproduction Assistant (SR09B) (2 x 7,932)	15,864	
Clerk Typist III (SR10B) (2 x 8,280)	16,560	
Secretary (SR13B)	9,456	
Fringe benefits (21.2%)	26,999	
Sub total		$154,351

Capitol Investments for Operation		
Systems programming (software)	$100,000	
Time sharing (operations)	100,000	
Microfiche duplicating (1,200 requests x 15 pp. = 18,000) (18,000 x $.50)	9,000	
Microfiche printer and developer	2,800	
Photocopying (1,200 requests x 50 pp. = 60,000) (60,000 x $.0078)	468	
Xerox copy machine Model 9200 ($1,781/mo. x 12)	21,372	
Sub total		$233,640
Publications		
Monthly newsletters (2 pp. x 12,000 newsletters at $36.20/5M = $173.76) ($173.76 x 12 months)	$ 2,085	
Semi-Annual Brochures (2 pp. x 12,000 brochures at $36.20/5M = $173.76) ($173.76 x 2)	348	
Quarterly Sample Packets (10 pp. x 12,000 packets at $36.20/5M = $868.80) ($868.80 x 4)	3,475	
Quarterly Dissemination activities letters (2 pp. x 400 letters at $6.20/400 = $12.40) ($12.40 x 4)	50	
Resource Guides (10 pp. x 12,000 guides at $36.20/5M = $868.80) ($868.80 x 3)	$2,607	
Other forms (evaluation forms, order forms, search request forms, etc.) (11 pp. x 1,500 forms at $10.70/1M = $176.55)	177	
Sub total		$ 8,742

In-Service		
Search negotiation (6 persons x $285 to San Francisco)	$1,710	
Lockheed DIALOG training (4 persons at $285 to San Francisco plus $65 registration per trainee)	1,400	
Per diem (10 x 4 days at ($40 per day)	1,600	
Subtotal		$ 4,710
Postage		
Newsletter (12 x $.50 x 215)	$1,290	
Brochure (12 x $.50 x 215)	1,290	
Sample packets (4 x $1.00 x 215)	860	
Dissemination activities letter (4 x $1.00 x 50)	200	
Resource guide (3 x $3.00 x 215)	1,935	
Other forms (2 x $.15 x 1,200)	360	
Search results (1,200 x $.50)	600	
Sub total		$ 6,535
Telephone (6 lines @ $16/mo x 12)		$ 1,152
Office supplies		$ 4,000
Private Car Mileage (2,918 miles x $.18 to all Oahu schools		$ 525
Inter-Island travel		
Plane fare (3 times to all islands	$ 996	
Per diem (3 days each trip)	540	
U-drive (18 days x $20/day)	360	
Sub total		$ 1,896
Total		$514,389

The advantages of this alternative are: it would build the Department's capability to provide searches for knowledge resources to persons concerned with improving education in Hawaii; it would provide clients with quick responses to their request; and it institutionalizes use of knowledge resources, i.e., making the use of knowledge resources a permanent feature of the Department.

The major disadvantage of this alternative is its high costs.

The third alternative to providing access to data bases is combining contractual services (i.e., SMERC & DIALOG, or SMERC & ORBIT, or SMERC & LIS) with the development of some Department capacity to provide searches for knowledge resources and delivery of resources. This involves use of services by brokers and vendors for searches requiring staff services and microfiche and/or photocopies, and use of linkers of the Hawaii Educational Dissemination Diffusion System to provide searches requiring quick responses, i.e., bibliographic lists and abstracts.

Coordination with personnel of the Hamilton Library, University of Hawaii resulted in obtaining a survey of the ERIC microfiche collection use during the Fall Semester, 1978. The survey disclosed that 68.5% of the documents requested were of the period 1976-78 and that 82.5% of the documents requested were of the period 1974-78. This finding suggests that one complete ERIC microfiche collection for 1966-73 could serve the needs of Hawaii's users.[2] Thus, linkers of the Hawaii Educational Dissemination Diffusion System will obtain resources entered during the period 1966-73 through the Hamilton Library. Development of the Hawaii Educational Dissemination Diffusion System capacity

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[2]Memo to Ms. Barbara Bird from Mr. Will Frost, HSSRD, Thomas Hale Hamilton Library, dated March 19, 1979.

involves purchase of the ERIC microfiche collection from 1976 to the present and for the period 1974-75 if funds permit it.[3]

The estimated costs of services per year for combining contractual services and development of the Department's capacity to provide access to knowledge resources and resources delivery are:

Contract for complete search services including delivery of microfiche and photocopies of selected references (700 searches per year)	$14,500	
In-service training and purchase of publications	2,900	
Sub total		$17,400
Contracts for access to data bases bibliographic lists and abstracts only; conducted by linkers of the Hawaii Educational Dissemination Diffusion System (500 searches x $12 per search)		6,000

[3]Recommendation of Ms. Barbara Bird, Information Specialist, Hamilton Library in a letter to Dr. Kellet Min, dated March 20, 1979.

Educational Resources Information Center materials		
Resources in Education (1974-78 microfiche collection)	$9,000	
Resources in Education Abstracts (1974-78)	400	
Resources in Education Index (1974-78)	200	
Current Index to Journals in Education (1974-78)	450	
Fifty most used Current Index to Journals in Education Publications (1974-48)	5,750	
Sub total		$15,800
Equipment to duplicate microfiche (printer and developer)		2,800
Total		$42,000

The Hawaii Educational Dissemination Diffusion System would be housed in classrooms freed due to declining enrollments.

The advantages of this alternative are: the modest development costs for basic resources ($18,600); builds Departmental capabilities; and in-house resources provide quick turnaround times for clients.

The major disadvantage of this alternative is the expenditure of $42,000.

During an interview, a reporter asked Secretary of State Forrestal how he became a great man. Forrestal replied, "By making right decisions." The reporter asked him how he learned to make right decisions. Forrestal replied, "Through experience." How did he gain such experience? "By making wrong decisions." After consideration of the advantages and disadvantages of the three alternatives, the decision was made to select alternative three.

c. Selecting a Cost-Effective Mixture of Services by Brokers and Vendors Within Alternative Three

The intent is to select a cost-effective mixture of services (i.e., SMERC & DIALOG, or SMERC & ORBIT, or SMERC & LIS) which promotes access to data bases containing knowledge resources to be used with the development of Departmental capacity. The data used for this determination were obtained by pilot testing the San Mateo Educational Resources Center, Lockheed's DIALOG, System Development Corporation's ORBIT, and Library Information Services. Pilot testing these services was made possible by a special purpose grant by the National Institute of Education.

Ten criteria were selected as effectiveness measures:

1. Turnaround Time. The turnaround time is the time in days from the date of transmittal of a search request to a service to the date of return of the search results. The mean turnaround time for each service was determined by consulting records of searches conducted from June 1, 1978 to November 30, 1978. Since all other criteria are ranged on a five-point scale, with smaller being better, the mean turnaround times were divided by six since the maximum mean turnaround time was approximately 30 days.

2-6. Questions 2-6 appeared on a Feedback Form[4], sent to each client with the search result. The criteria consist of the mean responses on a 5-point scale to each of the following questions:

2. To what extent is the information and/or assistance relevant to your original need?

3. How completely does the information and/or assistance address your original need?

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[4]National Institute of Education, Department of Health, Education, and Welfare, Request for OMB Clearance with Supporting Documents for the Evaluation of the State Capacity Building Program in Dissemination, May, 1978, (Durham, North Carolina: National Testing Service Research Corporation, 1978), Client Assessment Package A5, Immediate Feedback Form.

4. How timely is the information or assistance toward addressing your original need?

5. How useful is the information and/or assistance for its intended purpose?

6. To what extent would you recommend this service to a colleague in need of information/assistance?

The mean response for each question selected from the Feedback Form was completed for each service by averaging the responses on all Feedback Forms returned for each separate service from June 1, 1978 to November 30, 1978.

7-10. Questions 7-10 were asked of two linkers in the Hawaii Educational Dissemination Diffusion System. The criteria consist of the mean responses on a 5-point scale to each of the following questions:

7. Please rate each service on the ease of access to citations. Consider the amount of preparation you have to go through before the data is provided.

8. Please rate the difficulty involved in training (or being trained) to use the service.

9. Please rate the adequacy of relevant data in the data base of each service.

10. Please rate the ability of the service to handle all requests submitted.

The linkers of the Hawaii Educational Dissemination Diffusion System provided responses on a 5-point scale for each question.

Values of the ten criteria by services are displayed on Table 2.

Table 2

Values for Selected Criteria and Services

Criteria	SMERC Bibliographic Lists and Abstracts	SMERC Staff Services and Microfiche and/or Photocopies	DIALOG	ORBIT	LIS
1. Turnaround	3.65	4.02	0.85	0.60	2.76
2. Relevant	2.24	2.31	2.20	2.57	2.41
3. Meets Need	2.58	2.40	2.24	2.14	2.58
4. Timely	2.41	2.31	1.78	1.99	2.49
5. Useful	2.58	1.91	2.08	2.28	2.49
6. Recommend	1.66	1.12	1.25	1.57	1.58
7. Access	1.00	1.00	3.00	4.00	1.00
8. Training	1.00	1.00	2.00	3.00	1.00
9. Data Base	1.00	1.00	2.00	3.00	2.00
10. Handle Request	3.00	3.00	1.00	1.00	4.00
MEANS	2.11	2.01	1.84	2.22	2.23

Next, a composite effectiveness was determined by combining the values for bibliographic lists and abstracts, and staff services and microfiche and/or photocopies. The composite was determined by adding and dividing by two. The composite effectiveness is found on Table 3.

Table 3

Composite Effectiveness Value

Service Mixtures	Effectiveness Values		
	Bibliographic Lists and Abstracts	Staff Services and Microfiche and/or Photocopies	Composite Effectiveness
SMERC	2.11	2.01	2.06
SMERC + DIALOG	1.84	2.01	1.92
SMERC + ORBIT	2.22	2.01	2.10
SMERC + LIS	2.23	2.01	2.12

Composite costs were then determined by determining mean costs for bibliographic lists and abstracts, and staff services and michrofiche and/or photocopies. The composite costs are found on Table 4.

Table 4

Composite Costs

Service Mixtures	Bibliographic Lists and Abstracts	Staff Services and Microfiche and/or Photocopies	Composite Costs
SMERC	22.00	$22.00	22.00
SMERC + DIALOG	11.29	22.00	16.65
SMERC + ORBIT	14.54	22.00	18.27
SMERC + LIS	39.76	22.00	30.88

The cost-effectiveness values were determined by multiplying the composite effectiveness values by the composite costs values. This technique was used because effectiveness values were placed on a scale in which lower numerical values represented the desired conditions. The cost-effectiveness values are displayed on Table 5.

Table 5

Composite Costs-Effectiveness Values

Service Mixtures	Composite Costs	Composite Effectiveness	Composite C & E
SMERC	22.00	2.06	45.32
SMERC + DIALOG	16.65	1.92	31.96
SMERC + ORBIT	18.27	2.11	38.54
SMERC + LIS	30.88	2.12	65.46

An astute observer of problem-solving remarked that for every problem there are solutions which are simple, inexpensive, and wrong. The somewhat tortuous process used to concoct the best mixture constitutes an attempt to avoid wrong solutions. In short, the most cost-effective mixture of organized computer data bases which should be combined with state capabilities is SMERC and DIALOG.

2. Manually Accessed Data Files

The National Diffusion Network is a manually accessed data file which contains over 200 proven programs to meet the needs of students and those who educate them. This manually accessed data file is sponsored by the Division of Replication, U.S. Office of Education. A facilitator contract was awarded to the Department of Education in August, 1978. This contract permits access to the proven programs contained in the National Diffusion Network. A linker employed with contract funds is charged with spread services, exchange services, choice services, and implementation services (see Linker Services Objectives, The Linkage Component) relevant to the programs of the National Diffusion Network.

The products in the Northwest Regional Exchange Educational Materials Collection, Northwest Regional Educational Laboratory constitute a manually accessed data file which is accessible to persons concerned with improving education. Knowledge resources are made available through participation in a regional configuration of six states. Knowledge resources include materials for administrators, teachers, linkers, and learners. In addition to access to knowledge resources, participation in the Exchange results in consultive services, workshops, and linkages with Research Development and Utilization, other Regional Exchanges, other Educational Laboratories, and other dissemination activities.

A System for Locating and Reporting Innovative and Exemplary, Projects and Activities in Curriculum and Instruction. This is a manually accessed data file consisting of promising practices of the State of Hawaii. In accord with the expressed wishes of the sample of administrators, teachers, the Deputy Superintendent, and the recommendations of the Hawaii Educational Dissemination Diffusion System Task Force, linkers from the Hawaii Educational Dissemination Diffusion System will assist in expanding and disseminating this data file.

3. Recommendations

   a. It is recommended that the Hawaii Educational Dissemination Diffusion System conclude a contract with the San Mateo Educational Resources Center to obtain access to its data bases containing knowledge resources. Such a contract should be for 700 complete searches including delivery of microfiche and/or photocopies of selected references ($14,500) and for training and publications ($2,900).

   b. It is recommended that the Hawaii Educational Dissemination Diffusion System build its capacity to provide services by:

      . Concluding a contract with the Lockheed Missiles and Space Company, Inc., for access to the DIALOG information retrieval services. Such a contract should permit approximately 500 searches ($6,000)

. Purchase Educational Resources Information Center materials ($15,000)

. Purchase equipment to duplicate microfiche ($2,800)

c. It is recommended that the following manually accessed data files be made available to persons concerned with improving education in Hawaii:

. The National Diffusion Network

. Programs and products in the Northwest Regional Exchange

. State of Hawaii promising practices

III. THE LINKAGE COMPONENT

A. The Framework

The imprecise use of the term linkage befits its tenacious resistance to definitional consensus because of the many concepts connected with it. Indeed, other terms such as extension agentry and linkerhood have often been used to convey its concepts. It appears that motherhood is a fact; linkerhood, like fatherhood, is an opinion.

The opinion of the authors of this plan is that, in general, linkage is the connection between knowledge resources and persons who could benefit by using them. Forms of linkage include persons such as linkers, devices such as computers, institutions such as dissemination agencies, and communications such as brochures. Linkage involves stimulating the need for knowledge, obtaining knowledge resources, assisting in the use of resources, and providing exchanges of information between knowledge producers and knowledge users.

More specifically, as used in this plan, linkers are persons who: 1) possess personal attributes, such as low ego needs and high tolerance for ambiguity, which support linker services; 2) have relevant knowledge, such as understanding change models and search strategies, necessary for linker services; and 3) provide linker services, such as spread and exchange, in the organizational context of Hawaii. This chapter provides reasons for recommendations about personal attributes needed by linkers, knowledge required of linkers, and services provided by linkers in Hawaii.

In short, interpersonal communications are deemed the most important form of linkage. The human element is critical in connecting research and practice.

B. Personal Attributes Which Support Linker Services

The objective of this section of the plan is to delineate personal attributes desired of linkers in Hawaii. The indicators of objective accomplishment are: 1) the inclusion in this plan of a list of personal attributes which can be used as guides in hiring linkers for the Hawaii Educational Dissemination Diffusion System; 2) the use

of the list of personal attributes by interviewing committees; and 3) the use of the list of personal attributes in the evaluative process.

The methodology to delineate a list of personal attributes consists of examining suggestions by scholars who have studied the subject, then selecting those commonly suggested by a number of scholars and judged to be applicable to Hawaii by the authors of this plan. Additional attributes felt necessary for linkers in Hawaii are also included on the list.

1. Commonly Suggested Personal Attributes for Linkers

Examination of the literature discloses extensive combinations of qualities, attitudes, and attributes felt to be important to linkers. Culbertson,[5] for example, combined the ideas of Crandall, Havelock, Liebermann, Paul, Piele, Runkel, Schmuck and others and lists linker attitudes in three areas. Attitudes in the first area, education, are listed as: commitment to educational improvement, favorable self-concept and low ego needs, tolerance for ambiguity, positive views toward risk, acceptance of complexity, and flexible orientation to problem solving. Attitudes in the second area, spanning boundaries, are listed as: openness to ideas, tolerance for diversity, acceptance of uncertainty, positive perspectives on conflict, and commitment to search for alternatives. Attitudes in the third area, using knowledge based products and services, are listed as: commitment to knowledge utilization as a means for improving education, appreciation for diverse ideas and perspectives, motivation to acquire new ideas and products, positive views about applying theory to practice, and positive views of producers and users of knowledge.

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[5] Jack Culbertson, A Nationwide Training System for Linking Agents in Education (University Council for Educational Administration: Columbus, Ohio, 1977), pp. 308-310.

Examining several hundred documents, Ogden and Musumeci[6] listed the most frequently cited personal attributes as: appreciation of diverse ideas and perspectives, motivation to acquire new ideas, tolerance for ambiguity, favorable self-concept and low ego needs, positive view toward risk, flexibility, integrity, independence, sense of humor, orderliness, and candid and straight forward. A second strategy used by Ogden and Musumeci was interviewing a select group of state facilitators and developer/demonstrators. This strategy yielded the following attributes: being candid and straight forward, having a tolerance for ambiguity, ability to cope with frustrations, being concerned and supportive, triggering enthusiasm without going overboard, being tolerant of different viewpoints and being flexible.

After discussion and consideration, the authors of the plan felt the following commonly suggested attributes are of particular importance in Hawaii: 1) being candid and tactful, 2) being clear and tolerant of ambiguity, 3) being able to make proposals and appreciating other points of view, 4) being logical with a flexible orientation to problem solving, 5) being cooperative and self-directed, 6) being enthusiastic without going overboard, 7) being serious with a sense of humor, and 8) having pride in one's work and low ego needs.

2. Personal Attributes for Linkers in Hawaii

In addition to personal attributes commonly suggested for linkers across the country, attributes specific to Hawaii were considered. Attributes specific to Hawaii need to be considered because the decisional context in Hawaii is often characterized by a consensus mode rather than a voting mode. The voting mode may be simplistically described as presenting points of view and then voting on the course of action to be taken.

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[6] Evelyn Ogden and Marilyn Musumeci, A Taxonomy of Technical Assistance Skills (Rochelle Park, New Jersey: CAPLA Associates, 1977), p.3.

The consensus mode can perhaps best be described by observing a village meeting convened to decide on a course of action. The villagers gather in a circle and the village elder solicits what Westerners call input from all concerned. Gradually, those who are not much concerned with the decisions edge their way to the perimeter, while those whose oxen might be affected, press toward the center to make their views known. When the talk, and the participants are thoroughly exhausted, the leader suggests a consensus; if he guesses wrong, the talk resumes until a compromise consensus is achieved or dissenting participants silently acquiesce to a consensus. It is at this point the Westerner's inclination to end the meeting in a recorded vote destroys the consensus. Voting under these situations gives an equal voice to those who couldn't care less, divides many sided complexities into a two-sided simplification, freezes the losing minority in its point of view, and moulds the future by political arithmetic rather than the consciences of the human beings concerned. To be sure, there are situations when voting is the best course of action; however it should be used judiciously.

Some of the key personal attributes necessary for consensus situations are: 1) being task oriented and patient, 2) being supportive and discriminative, 3) being able to analyze and synthesize creatively, and 4) having perseverance and judgment when discontinuance is the best course.

3. Recommendations

a. It is recommended that the following personal attributes be used as guides in selecting linkers in Hawaii:

- Being candid and tactful
- Being clear and tolerant of ambiguity
- Being able to make proposals and appreciating other points of view
- Being logical with a flexible orientation to problem solving
- Being cooperative and self-directed
- Being enthusiastic without going overboard
- Being serious and having a sense of humor
- Having pride in one's work and low ego needs

. Being task oriented and patient
. Being supportive and discriminative
. Being able to analyze and synthesize creatively
. Having perseverance and the judgment to discontinue when it is the best course of action

b. It is recommended the personal attributes be shared with interviewing committees convened for the purpose of selecting linkers for the Hawaii Educational Dissemination Diffusion System.

c. It is recommended that the personal attributes be used by the Project Director of the Hawaii Educational Dissemination Diffusion System in appraising linkers in the yearly evaluation process.

C. Relevant Knowledge Necessary for Linker Services

The objectives of this section of the plan are: 1) to describe charge models, 2) to list some skills necessary for linkers, and 3) to discern staff development needs. The indicators of objective accomplishment are: 1) the inclusion in this plan of brief descriptions of change models which should be considered by linkers, 2) the inclusion in this plan of skills expected of linkers, and 3) the inclusion in this plan of staff development needs for linkers.

The methodology used to accomplish the objectives of this section involves examining change models and briefly describing assumptions and advantages applicable to Hawaii. The existence of such an interesting array of models demonstrates a pluralistic environment, and the challenge is to limit the scope of the descriptions to the objectives of this section.

Examination of change models also suggests skills necessary for linkers. Skills are examined and organized in accord with the framework of this plan.

The skills are also examined for staff development needs. This examination results in a list of instructional needs.

1. Change Models

The complexities of contemporary educational systems encourage understanding change models. Understanding educational change

is particularly important because a remarkable number of persons think they understand it, or have plans to control it, or know for a fact that it is not necessary.

The intent in describing change models is to provide Hawaii's linkers with concepts which provide the basis for their actions and which should be further pursued when time permits it. Four models will be briefly presented; the first three were identified by Havelock[7] as the Research Development and Diffusion Model, the Social-Interaction Model, and the Problem-Solving Model; the fourth model is described by Havelock and Lingwood[8] as the Linkage Process Model.

The Research Development and Diffusion Model follows a rational sequence of research, knowledge production, and dissemination including packaging, marketing, and distribution. It assumes the existence of passive consumers who act rationally and who will accept innovations if they are well developed and delivered in the right way at the right time. The advantages of this approach include large scale planning, thorough development, and comprehensive evaluation. Moreover, this approach makes adoptions easy.

The Social-Interaction Model places emphasis on approaching influential potential adopters and spreading innovations through communication networks already in existence. It assumes that the consumers hold a variety of positions in social networks and that persons adopt attributes and behaviors they perceive as belonging to their psychological reference groups. The advantage of this approach is that it emphasizes consideration of intricate

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[7] R. G. Havelock, Planning for Innovation Through Dissemination and Utilization of Knowledge (Ann Arbor, Michigan: Institute for Social Research, The University of Michigan, 1969).

[8] R. G. Havelock and D. A. Lingwood, R & D Utilization Strategies and Functions: An Analytic Comparison of Four Systems (Ann Arbor, Michigan: Institute for Social Research, The University of Michigan, 1973).

. Being task oriented and patient
. Being supportive and discriminative
. Being able to analyze and synthesize creatively
. Having perseverance and the judgment to discontinue when it is the best course of action

b. It is recommended the personal attributes be shared with interviewing committees convened for the purpose of selecting linkers for the Hawaii Educational Dissemination Diffusion System.

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interpersonal relationships, organizational structures, and communication processes involved in dissemination.

The Problem-Solving Model stresses the role of the consumer who senses a need, formulates a problem statement, conducts a search for information, tries an innovation, and evaluates the innovation. This approach assumes that self-initiated change is the most effective basis for long-term improvement. The advantages of this approach include giving strong consideration to consumer needs, encouraging linkers to be collaborators rather than solution givers, and giving flexibility to school personnel befitting full professional partners.

The Linkage Model emphasizes persons, devices, organizations, and media which connect resources and users. This model starts with a problem solver who senses a need, makes a problem statement, conducts a search for information, tries a solution, and evaluates the solution. During these processes, the user enters into a collaborative relationship with a linker who uses processes corresponding to those of the user. The linker also seeks corresponding assistance with experts and these overlapping linkages connect remote resources with the user. The advantage of this approach is that it incorporates the strategies of the Research Development and Diffusion Model, the Social-Interaction Model, and the Problem-Solving Model.

In summary, four change models have been described to provide linkers with some of the assumptions and advantages of the various models. While the Linkage Model appears promising, it assumes common values among participants and requires complex interpersonal relationships; the evidence is not yet definitive as to which model works best under what conditions. It would thus be unwise to dictate an approach which should be scrupulously applied to the concerned as well as the unconcerned. Dictation of an approach would serve to curb flexibility, discretion, and improvisation which attracts linkers to their jobs in the first place. In practice, linkers need to consider their personal pre-

ferences and skills, the preferences and skills of their clients, and the time and resources available to them.

2. Skills Necessary for Linkers

The intent is to list some skills necessary for linkers when providing services. This list should identify some general skills and some specific skills which flow from the change models presented earlier in this plan. Identification of skills is thought to be helpful because different skills are necessary for different models. Accordingly, linkers should use combinations of skills. It is certainly recognized that employing combinations of skills is not an easy task because of the seemingly immutable law governing choices: given choices, the tendency is not to choose the best combinations of possible alternatives.

General skills appear necessary for virtually all linker services and are difficult to transmit through specific instructions. These skills are valuable in meetings, especially large ones. For example, it is often observed that the more complex the issue, the higher the ratio of emotion to reason, nonsense to sense. Meetings often result in favoring simple formulations over complicated ones, certainty over ambiguity, and the vocal person over the reflective person. Unless conducted with skill, meetings are likely to generate confrontations rather than compromises and likely to result in inaction rather than action. General skills are also necessary in dealing with situations where procedures become the surrogates for substance. It is easier to prevail with a negative objection than with a positive program. To be sure, objections are frequently made in disguise: you have failed to follow the correct procedures or guidelines, you did not consult with a specific person or with authorized representatives, you did not consult early enough or long enough, you neglected to prepare the proposal in proper form or provide the requisite number of copies. Such objections are devastating to a proposal especially when persons are inattentive, confused, or hungry. In short, some of the general skills involved are 1) listening skills, 2) analysis

skills, 3) synthesis skills, 4) communication skills, 5) conflict management skills, and 6) interpersonal skills.

Specific skills desired of linkers have been obtained from the literature[9] and organized in accord with the activities of dissemination and diffusion. They are:

Spread skills are associated with the one way casting out of knowledge in all its forms such as information, products, ideas, and materials:

- Provide general information on knowledge resources through brochures and packets in formats, styles, and languages suitable to all clients
- Provide information on specific products which may be useful to specific clients
- Provide comparative information on different products
- Demonstrate products or practices
- Conduct awareness conferences
- Promote and advertise products, services, and practices

Exchange skills are associated with two-way or multi-way flow of information, products, ideas, and materials as to needs, problems, and potential solutions:

- Negotiate information searches requested by clients
- Search for information requested by clients
- Connect clients to knowledge sources or access points
- Deliver search results to clients
- Conduct needs sensing activities to discern future client needs
- Transmit client needs and suggestions to researchers and developers
- Conduct conferences where developer/demonstrators can exchange information with clients

Choice skills are associated with assisting rational consideration and selection among information, products, ideas, and materials from educational research and development that can be used to improve education:

- Arrange for site visitations
- Assist in stating problems

[9]Jerry L. Fletcher, and others, Final Report of the Dissemination Analysis Group to the Dissemination Policy Council, 1977.

- Assist in stating objectives
- Assist in examining alternatives
- Evaluate products according to criteria relevant to clients such as validity, reliability, practicability, costs, and benefits
- Summarize resources
- Synthesize diverse resources
- Assist in formulating recommendations

Implementation skills are associated with the adoption and adaption of improvements:

- Assist in in-service training
- Assist in adopting improvements
- Assist in finding long-term financial support
- Assist in evaluating
- Assist in adapting improvements
- Assist in developing policies, regulations and procedures which foster the continuation of improvements

3. Linker Staff Development Needs

The intent is to discern staff development needs for linkers. Instruction is needed for all linkers because linkers constitute new positions in the State. Staff development needs were obtained from examining the general skills and special skills needed by linkers. It is recognized that training sessions can be deadly and must be selected with care. Indeed, a linker once remarked that if he ever died, he hoped it would happen at a linker training session because the transition from life to death would be minimal. The following staff development needs are posited for linkers in Hawaii.

General skills for staff development

- Listening skills
- Analysis skills
- Synthesis skills
- Communication skills
- Conflict Management skills
- Interpersonal skills
- Knowledge concerning the application of change models
- Knowledge concerning national directions of dissemination and diffusion
- Knowledge concerning psycho-social considerations for change

Spread skills for staff development

- Promoting and advertising services, products and practices
  This involves publicizing services, products, and practices.

Exchange skills for staff development

- Negotiating information searches required by clients
  This involves translating client requests into informational requirements.
- Searching for information requested by clients
  This involves formulation for search strategies, utilization of Educational Resources Information Center (ERIC), acquisition of knowledge resources, and assessment of the relevance of knowledge resources to actual client needs.
- Delivering search results to clients
  This involves choosing formats, eliciting evaluations, and encouraging future services.

Choice skills for staff development

- Tailoring resources for specific clients
  This involves screening, analyzing, and synthesizing knowledge resources.
- Assisting in stating objectives
  This involves learning how to ask the right questions so that the effort will not be misdirected.
- Assisting in examining alternatives
  This involves obtaining, synthesizing, and arraying resources as well as generating practical alternative solutions to choose from.
- Assisting in formulating recommendations
  This involves assisting the evaluation of alternatives, choosing the best alternative, and gaining acceptance of the alternative.

Implementation skills for staff development

- Assisting in adopting improvement
  This involves scheduling, making task assignments, and funding.
- Assisting in evaluation
  This involves developing an evaluation plan, collecting data, analyzing data, and determining whether or not objectives are being accomplished.
- Assisting in adapting improvements
  This involves matching the characteristics of innovations with those of the project and making refinements before the adoption as well as refining the improvements using evaluative data.

4. Recommendations

a. It is recommended that Hawaii's linkers consider the assumptions and advantages of change models, their personal preferences and skills, the preference and skills of clients, and the time and resources available to them when providing services.

b. It is recommended that Hawaii's linkers use the list of skills in this plan as guides as to services expected of them.

c. It is recommended that the Project Director for the Hawaii Educational Dissemination Diffusion System arrange to have instruction conducted during the first project year for the items identified under "staff development needs" in this plan.

d. It is recommended that the Project Director for the Hawaii Educational Dissemination Diffusion System conduct yearly appraisals of staff development needs and arrange for instruction to meet needs.

D. Linker Services in the Organizational Context of Hawaii

The objectives of this section of the plan are: (1) to delineate linker service objectives, and (2) to delineate delivery of linker services. The indicators of objective accomplishment are: (1) inclusion in this plan of service objectives for linkers, and (2) selection of an approach for delivering linker services to clients.

The methodology to delineate linker services consists of examining linker services and setting tentative service objectives. The methodology used to select an approach for delivery of services to clients consists of examining organizational features in Hawaii and selecting a harmonious delivery alternative based on the judgements of the authors of this plan.

1. Linker Service Objectives

In this plan, linker services are posited to be congruent with the activities of dissemination and diffusion and with skills expected of linkers. Thus, the services of linkers are:

Spread Services

- Provide general information on knowledge resources through brochures and packets in formats, styles, and languages suitable to all clients
- Provide information on specific products which may be useful to specific clients
- Provide comparative information on different products
- Demonstrate products or practices
- Conduct awareness conferences
- Promote and advertise products, services, and practices

Exchange Services

- Negotiate information searches requested by clients
- Search for information requested by clients
- Connect clients to knowledge sources or access points
- Deliver search results to clients
- Conduct needs sensing activities to discern future client needs
- Transmit client needs and suggestions to researchers and developers
- Conduct conferences where developer/demonstrators can exchange information with clients

Choice Services

- Arrange for site visitation
- Tailor resources for specific clients
- Assist in stating problems
- Assist in stating objectives
- Assist in examining alternatives
- Evaluate products according to criteria relevant to clients such as validity, reliability, practicability, costs, and benefits
- Summarize resources
- Synthesize diverse resources
- Assist in formulating recommendations

Implementation Services

- Assist in in-service training
- Assist in adopting improvements
- Assist in finding long-term financial support
- Assist in evaluating
- Assist in adapting improvements

. Assist in developing policies, regulations and procedures which foster the continuation of improvements

Examination of these categories of linker services readily reveals that they require differing levels of skills, time and finances. Spread services, for instance, can be provided to many clients, require no personal interaction, require modest skill development, and require relatively low costs. By contrast, implementation services would probably require the full range of linker services. Implementation services involve a high degree of interpersonal interaction, require intensive linker staff development, and only a few clients can be served at a time.

In addition to the need for considering linker services, it is necessary to consider client characteristics because they differ concerning their initiatives to seek improvement, their enthusiasm for knowledge resources, and their resistance to reveal needs for external assistance. Clients also differ in their needs for interpersonal relationships and the degree to which non-rational elements affect them.

In short, the linker will probably be most influential in situations where there are expressed needs for assistance and where the linker has the expertise to provide that assistance.

In an interview with the late agnostic philosopher, Bertram Russell, Leo Rosen asked, "Suppose you actually found yourself standing before the Throne, and there in all His glory sat the Lord. What would you say?" Russell replied, "I would probably ask . . . Sir, why did you not give me better evidence?" The evidence in support of setting service objectives does not appear to be sufficient. Nevertheless, tentative objectives have been set after scrutinizing services for six months provided on a pilot basis through a special purpose grant by the National Institute of Education and a facilitator contract by the United States Office of Education. The tentative service objectives are based on four

full-time linkers, a full-time secretary, a half-time librarian, and part-time services by four planning analysts.

The potential population which would be served consists of the following:

Clients	Numbers
Governor's Staff	25
Legislature	76
Board of Education	9
State Educational Officers	153
District Educational Officers	78
Principals and Vice-Principals	328
Teachers	8,000
School Librarians	226
Private School Principals	144
Private School Teachers	2,000
Citizens interested in improving education through service on advisory councils, commissions, and school committees	961
TOTAL	12,000

The tentative yearly linker services objectives are:

Services	Number of Clients Served	Percent
Spread Services	12,000	100
Exchange Services	1,200	10
Choice Services	240	2
Implementation Services	120	1

The experiences with services provided on a pilot basis for six months through the special purpose grant by the National Institute of Education indicate that requests for services according to the tentative service objectives can be accommodated by the staff provided for in this plan: four linkers, one secretary, one half-time librarian, and part-time services by four planning analysts. However, if an unanticipated large demand for services should occur the following service priorities will be followed:

Spread Services and Exchange Services. All clients: the Governor and his Staff members, Legislators and their staffs, Board of Education members, State Educational Officers, District Educational Officers, Public School Principals

and Vice Principals, Public School Teachers, School Librarians, Private School Principals, Private School Teachers, and Citizens interested in improving education through service on advisory councils, commissions and school committees.

Choice Services. The following groups will be served on a first priority basis because of their decision-making responsibilities: the Governor and his Staff, Legislators and their staffs, Board of Education members, the Superintendent, the Deputy Superintendent, Assistant Superintendents, and District Superintendents.

The following groups will be served on a second priority basis because it would enhance these natural linker's skills in keeping abreast of and disseminating information about educational improvements: State Educational Officers, District Educational Officers, School Librarians, Public School Principals, and Private School Principals.

The following groups will be served on a third priority basis: Public School Teachers, Private School Teachers and Citizens interested in improving education through service on advisory councils, commissions, and school committees.

Implementation Services. The following groups will be served on a first priority basis because implementation services are geared to their needs and because of the immediate impact on students: Public School Principals, Public School Teachers, Private School Principals, and Private School Teachers.

2. Service Delivery in the Organizational Context of Hawaii

The Hawaii State Department of Education is a state school system; all public schools are administered through the State Superintendent. A nine-member elected Board of Education appoints the State Superintendent, who in turn, selects the Deputy Superintendent, the Assistant Superintendent for Instructional Services, the Assistant Superintendent for Personnel Services, the Assistant Superintendent for Business Services, and the Assistant

Superintendent for Library Services (the State Library System is administered through the State Department of Education); the State Superintendent also selects seven District Superintendents and their Deputies.

State resources include 153 members who provide staff services to the districts and schools; of this number, 77 are charged with providing curriculum leadership to the school system in educational theory, concepts and methodology by keeping abreast of and disseminating information regarding new educational developments. There are 78 district staff members; of this number, 47 are charged with facilitating educational programs at the schools.

School level resources include 223 regular public schools and 5 special schools which employ 8,000 teachers and educate 170,000 students. There are 144 private schools which employ 2,000 teachers and educate 35,000 students; the private school student population comprises 17% of the total student population in Hawaii.

Information resources include 226 school libraries, 44 public libraries, 9 university and college libraries, the Legislative Reference Bureau Library, and the Hawaii Institute for Management Analysis in Government. With the exception of the school libraries, these resources are also available to the private schools.

Within the organizational context of Hawaii, linker services can be delivered through three major approaches. The first approach is designating a staff member in each of the seven districts as a linker and providing them with instruction. Under this alternative back-up technical support such as information searches and evaluation services could be provided by three state coordinators. The major advantages to this approach are low costs ($61,653 per year for salaries and fringe benefits for three state educational officers, EO5-1), use of the on-going communications networks from districts to schools, and control by district superintendents (linkers would continue

to function under the supervision of the district superintendents). The major disadvantages are that already overworked district staff members would be given added duties, and that district superintendents would not be totally supportive of this approach because it would mean foregoing some of the tasks already assigned to district staff members.

The second approach for delivering linker services is hiring a linker for each of the seven districts. Back-up technical support and coordinative support would be provided by one state coordinator. This approach has the advantage of being more effective than the first approach because linkers would be able to devote their full attention to providing linker services. Further, district superintendents would be supportive of this approach because it would significantly increase district capabilities. The major disadvantages to this approach are the costs of district linkers ($140,244 per year for salaries and fringe benefits for seven teacher-linkers, TO5-7, and one coordinator, E05-1).

The third approach is a mixture of the first and second approaches. It involves hiring four linkers and housing them at the state office. The advantages to this apprach are: costs ($82,275 per year for salaries and fringe benefits for two educational officers, E05-1, and two teacher-linkers, T05-1) are within reach; this approach provides visibility because services would come from the office of the Superintendent; services to the Governor's staff, Legislative staff, Board of Education, public school personnel and citizen groups can be expedited because requests would be made directly to the state; and this approach provides services according to needs, i.e. rather than starting with seven linkers, personnel can be added if the need arises. The major disadvantage is that four linkers can provide only a limited amount of services to the districts; on the other hand, this approach would in the long run, assist educational specialists and school librarians to

become more involved in dissemination because services would be provided to them on a priority basis. This approach also requires close coordination with District Superintendents and educational specialists, keeping them informed of the interests of their principals and teachers.

The third approach is recommended for this plan. This approach which slightly increases the number of the state bureaucracy has the added advantage of delighting chauvinistic district and school personnel. A teacher was heard to say, "Thank heaven for the State bureaucracy; I cannot blame everything that goes wrong on my wife."

3. Recommendations

a. It is recommended that the tentative yearly linker services objectives be set at:

Services	Number of Clients Served	Percent
Spread	12,000	100
Exchange	1,200	10
Choice	240	2
Implementation	120	1

b. It is recommended that linkers keep logs of services reflecting spread, exchange, choice and implementation services.

c. It is recommended that the Hawaii Educational Dissemination Diffusion System Project Director submit quarterly reports to District Superintendents on linker services provided to their personnel.

d. It is recommended that the Project Director of the Hawaii Educational Dissemination Diffusion System analyze linker services on a yearly basis and set realistic objectives; annual services and objectives for the next year should be included in the annual report to the Superintendent.

e. It is recommended that four linkers, a secretary, and a half-time librarian be hired and housed in the Planning Services Section of the Office of the State Superintendent.

IV. THE LEADERSHIP COMPONENT

A. The Framework

There was a time, celebrated in song and story, when goal-setting and dissemination were the province of leaders. Their number was small, their information was meager, their expertise was primitive, their range of options was narrow but they were in charge of goal-setting and dissemination. In Aristotle's Athens, Confucius' China, Cicero's Rome, Jefferson's Virginia, the educated and affluent set policies and then disseminated information. The uneducated constituted more than 95 percent of the population and were not expected to join the elegant conversations on goal-setting. Dogma, doctrine, and dictation dominated dissemination.

As mankind progressed, the process we now call modernization made the vertical society obsolete. The traditional modes of dissemination, i.e., passing information down, did not work in societies governed neither by a few hundred nobles nor a few thousand landholders but, rather, by an aristocracy of achievement measured in millions.

Indeed, today, a major problem at the institutional level is that many persons appear unsure of goals. It may be helpful, then, to restate the goals of the Department of Education in order to foster a common framework. Broadly stated, the goals are:

- To provide educational programs and activities that enhance basic skills such as reading, writing, computing, listening, speaking, and reasoning which permit the acquisition of knowledge.
- To provide educational programs and activities that impart knowledge in such areas as sciences, physical education, health, practical arts, and vocational-technical education, and competencies in such areas as decision-making, independent learning, development of a positive self-concept, and relating to others which facilitate self-realization and accomplishment of civic responsibilities.

. To provide educational programs and activities in such areas as social sciences, history, music, art, literature, guidance, culture, and values that impart knowledge and inculcate positive ideals, attitudes, and opinions in such areas as moral and ethical behavior, leadership and service, social and ethnic differences, and beauty and its creation which facilitate individual fulfillment and supranational improvement.

. To provide administrative directions in such areas as planning, budgeting, managing, and data processing, and administrative support in such areas as personnel, business, and instructional services which advance educational programs and activities.

The goal of the Hawaii Educational Dissemination Diffusion System is to support the Department's goals. Within this framework, leadership may be thought of as encompassing three major functions: 1) planning, 2) supporting, and 3) evaluating. This chapter provides reasons for recommendations on these three major functions relevant to dissemination activities.

B. Planning

The objective of this section is to provide some notions which underpin this plan. The indicators of objective accomplishment are: 1) the inclusion in this plan of concepts which have guided its development and 2) the inclusion of recommendations for future planning:

1. Concepts Which Guide Planning

Reactions to planning endeavors are understandably ambivalent. On one hand, reactions to planning are negative. Because the record of successes in prognosticating futures is notoriously bad, there is tendency to mistrust planning. Another reason for negative reactions to planning involves the sad history of mismatches between plans and realities; for instance, many plans have not been effective because they called for changes beyond resource capabilities or they made presentations in generalities which necessitated additional planning for implementation. Still another reason for negative reactions to planning stems from the fact that

planning often recommends changing current modes of operation. For example, fragmented project approaches are often desired by many persons because they give an aura of progress, and planning usually reveals that costs would prohibit statewide implementation. These trepidations are evident in the following rumor: When an educational planner died and arrived at the Heavenly Gates, St. Peter motioned aside two clergymen and took the planner into Heaven before them. "Why him ahead of us?" the men of the cloth asked. "Haven't we done everything possible to spread the good word?" "Yes,"said St. Peter, "But this planner scared the hell out of more people than you did."

On the other hand, reactions to planning are positive because a little reflection convinces most persons that as changes occur, they must examine practices of the past to see if they apply to the present, and adjust them or create new programs to fit the future. Generally, planning is the concept that tomorrow's futures are affected by what is done today; the possibilities the future stem from understanding the options available and the consequences of exercising various combinations of them. More specifically, planning is setting objectives and developing strategies for achieving them. This plan sets objectives, provides indicators which assist in determining whether or not objectives are accomplished, makes recommendations to accomplish objectives, and provides costs of implementing objectives.

Another important concept guiding the development of this plan is coordination among state agencies engaged in dissemination activities. Coordination can take the form of an advisory council or network. Such a network involves agreed upon objectives, voluntary participation, and assistance of a staff who does the leg work. One objective of the network is to use collective expertise in guiding the activities of the Department's dissemination efforts. This objective involves providing advice and consultations.

A second objective is to bring together persons who have interests in dissemination so that they can inform and assist each other. This involves informing each other of similar services and/or different or overlapping clients. The University Library System, for example, provides spread and exchange services for their clients who are primarily made up of professors and students, but it does not have sufficient resources to provide these services to the entire clientele of the Department of Education. Further, the University Library System is not organized to provide choice or implementation services because these services are unneeded by its clientele. Similarly, the public libraries provide spread and exchange services to the general public but may not have specialized knowledge resources for teachers who are also part of the general public. Thus, knowledge of services provided by other agencies should result in referrals and improved services to clients.

As with any complex undertaking, this plan has limitations. First, many important areas of dissemination and diffusion are not discussed; thus, those areas which are addressed constitute the priorities of the Hawaii Educational Dissemination Diffusion System. Future revisions and directions include publication of newsletters, preparation of linker transformed materials, provision of training for natural linkers (district educational specialists, state educational specialists, and school librarians), and development of a human resources file. A second limitation is that educational planning is an art, not a science. Accordingly, this plan is a guide, not a blueprint. Changes in data, funding, and implementation will necessitate periodic updating.

2. Recommendations

   a. It is recommended that an advisory council be convened of persons representing agencies involved with dissemination activities. Such a network might include:

      . The University of Hawaii Library System
      . The Hawaii Newspaper Agency
      . The Office of Instructional Services, Department of Education

- . The Office of Library Services, Department of Education
- . District Offices, Department of Education
- . Public Schools, Department of Education
- . Teachers, Department of Education
- . The Hawaii Association of Independent Schools
- . The Legislative Reference Bureau
- . Curriculum Research and Development Group, University of Hawaii
- . Department of Curriculum and Instruction, University of Hawaii
- . The Hawaii Institute for Management and Analysis in Government

b. It is recommended that this plan be periodically updated.

C. Supporting

The objective of this section is to describe supportive actions which foster improving education. The indicators of objective accomplishment are: 1) inclusion in this plan of reasons for supportive actions, and 2) inclusion of recommendations creating a supportive environment and providing financial support.

1. Creating a Supportive Environment

A supportive environment is necessary if changes which improve education are to be effectively implemented and sustained. The importance of the support of the Superintendent, the Deputy Superintendent, Assistant Superintendents, and District Superintendents cannot be overemphasized. Without the support of these groups, favorable outcomes are unlikely. The support of these groups does not entail instructions on how to do something, but rather, giving moral support and creating an environment which gives legitimacy to using knowledge resources to effect change, and providing incentives to improve practices.

At meetings, in reports, and in providing information to the news media, statements of encouragement to educational practitioners to use knowledge resources creates a supportive environment. Encouraging statements on innovations are particularly necessary because of the media's tendency to feature the most extreme and partisan positions while ignoring as unnewsworthy the voices of reason, the counsels of compromise, and the programs that work.

Giving legitimacy to using knowledge to effect change involves providing principals and teachers with access to knowledge resources and services encouraging use of the resources. It also involves providing principals with increased control over ways in which knowledge resources, programs, and materials can improve education in school. Further, it involves encouraging a participative management style which includes teachers, parents, and students in the decision-making process.

Providing incentives to improve practices involves considering rational as well as emotional factors which affect change. People are willing to attempt improvement because it helps students and it is rewarding to them personally, to their psychological reference groups, and to their institutions. The processes which lead to change must have payoff values to all parties concerned.

2. Providing Financial Support

The past three decades have been characterized by a substantial federal investment in educational research. However, states have been slow to develop systems which promote the use of research results. In 1975, the National Institute of Education initiated the program to strengthen state dissemination capabilities through special purpose grants and capacity building grants. A special purpose grant was awarded to the Hawaii State Department in 1978 to prepare this plan. A capacity building grant was awarded for 1979 to implement this plan. Additionally, a Facilitator contract was received from the U.S. Office of Education in 1979. Development of the Department's dissemination capacity, then, will be accomplished through a mixture of federal funds and state funds. This mixture is displayed on Table 6, Table 7, Table 8 and Table 9.

Table 5

A Mixture of Budgetary Plans Concerning Personnel								
Categories	Full-time Equivalence	Salary Range	Years 1979	1980	1981	1982	1983	1984
Coordinator*	1.00	E05-1	$ 17,214	$ 18,161	$ 19,160	$ 20,214	$ 21,326	$ 22,499
Linkers*	2.00	T85-7	28,744	30,325	31,993	33,753	35,609	37,567
Summer Salary for Linkers* (July and August)	1.00	T85-7	4,704	4,963	5,236	5,524	5,828	6,149
Secretary*	1.00	SR11-D	9,716	10,250	10,814	11,409	12,036	12,698
Librarian*	.50	SR-15B	5,314	5,606	5,915	6,240	6,584	6,946
Student Helper*	.50	$3.20/hr.	4,224	4,456	4,701	4,960	5,233	5,521
Facilitator**	1.00	E05-1	17,214	18,161	19,160	20,214	21,326	22,499
Fringe			15,883	17,812	18,792	19,826	20,917	22,067
Administrator***	.20	-	5,890	6,214	6,556	6,917	7,297	7,698
3 Analysts***	.40	-	10,278	10,843	11,439	12,068	12,732	13,432
Sub Total			$120,181	$126,791	$133,766	$141,125	$148,888	$157,076

* Funds from the Capacity Building Grant, National Institute of Education

** Funds from the Facilitator Grant, U.S. Office of Education

*** State in-kind services

Note: All salary calculations are based on an assumed 5.5% salary increase for each collective bargaining year (September for certificated personnel--Coordinator, Linkers, Facilitator, Administrator, and Analysts; and July for classified personnel--Secretary, Librarian, and Student Helper).

Table 7

A Mixture of Budgetary Plans Concerning Travel and Equipment						
Categories	Years 1979	1980	1981	1982	1983	1984
Required Travel for Project Director, NIE*	$ 2,406	$ 2,647	$ 2,912	$ 3,203	$ 3,523	$ 3,875
Required Travel for Project Director, USOE**	1,394	1,533	1,686	1,855	2,041	2,245
Linker Travel for In-Service Training***	3,615	1,980	1,178	2,396	2,636	2,900
Site Visitations for Districts and Schools**	6,531	10,184	11,265	12,496	13,810	15,306
ERIC Materials*	2,000	2,000	2,200	4,840	5,324	5,856
Communication Controller and Modem Rental*	846	931	1,024	1,126	1,239	1,363
Desks and Tables ***	1,606	306	-	-	-	-
Chairs***	525	158	-	-	-	-
Typewriters***	2,935	-	-	-	-	-
Calculator***	150	-	-	-	-	-
File Cabinets***	150	600	-	-	-	-
Microfiche Readers***	4,052	1,227	-	-	-	-
Sub Total	$26,210	$21,566	$20,265	$25,916	$28,573	$31,545

* Funded by Capacity Building Grant, NIE

** Funded by Facilitator Grant, USOE

*** State In-Kind Services

Note: Year 1979 costs are budgeted costs. Cost estimates for each succeeding year is based on 10% inflation.

Table 8

A Mixture of Budgetary Plans Concerning Supplies and Contractual Services						
Categories	Years 1979	1980	1981	1982	1983	1984
Supplies*	$ 894	$ 962	$ 281	$ 1,189	$ 1,308	$ 1,439
Supplies**	717	1,089	1,189	1,396	1,896	2,346
Contractual						
San Mateo Educational Resources Center* (SMERC)	17,400	12,800	10,400	13,640	13,090	12,210
Lockheed/DIALOG*	5,000	4,000	3,000	7,986	8,785	9,664
Consultants*	1,700	-	-	-	-	-
Consultants**	3,000	7,600	9,200	10,700	12,211	13,911
In-Servicing*	450	-	-	-	-	-
Sub Total	$29,161	$26,451	$24,070	$34,911	$37,290	$39,570

* Funded by Capacity Building Grant, NIE

** Funded by Facilitator Grant, USOE

Note: Year 1979 costs are budgeted costs. Cost estimates for each succeeding year is based on 10% inflation.

Table 9

A Mixture of Budgetary Plans Concerning Others and Indirect Services With Summary of Funds						
Categories	Years 1979	1980	1981	1982	1983	1984
Other*	$ 577	$ 635	$ 137	$ 769	$ 846	$ 931
Other**	500	1,010	1,210	1,610	2,010	2,529
Indirect* (5.9%)	6,962	7,125	7,125	5,875	4,001	-
Indirect** (5.9%)	1,950	2,726	2,998	3,299	3,629	3,992
Classrooms***	9,600	9,600	9,600	9,600	9,600	9,600
Sub Total	$ 19,589	$ 21,096	$ 21,070	$ 21,153	$ 20,086	$ 17,052
Total	$195,141	$195,904	$199,171	$223,105	$234,837	$245,243
Summary of Fund Sources						
NIE	$124,955	$120,756	$120,756	$ 99,576	$ 67,806	-0-
USOE	35,000	46,200	50,820	55,908	61,500	67,656
State In-Kind	35,186	28,948	27,595	28,585	29,629	30,730
Others	-	-	-	39,036	75,902	146,857
Totals	$195,141	$195,904	$199,171	$223,105	$234,837	$245,243

* Funded by Capacity Building Grant, NIE

** Funded by Facilitator Grant, USOE

*** State In-Kind Services

Note: Year 1979 costs are budgeted costs. Cost estimates for each succeeding year is based on 10% inflation.

As indicated by Tables 6-9, the financial support for dissemination from the National Institute of Education will gradually diminish and stop after 1983. If institutionalization (i.e. making the use of knowledge resources a permanent feature of the Department) is desired, other sources of funds are required. Obtaining funds for reasons other than traditional purposes using modern budgetary procedures is difficult. Indeed, if the money needed for the cross at Calvary had to follow modern budgetary processes, Good Friday and Easter would never have made the Christian calendar; someone could have easily created a budgetary impasse that even the Romans could not have untangled.

Further funding directions might follow the increasing federal requirements for dissemination. For example, such programs as Title I, Title IV-C, Vocational Education, Bilingual Education, and Special Education all have dissemination components required by legislation. As the benefits of utilizing knowledge resources become realized, it is anticipated that managers of federal programs will willingly put aside funds to continue dissemination services.

3. Recommendations

a. It is recommended that the Superintendent express support for use of knowledge resources in improving education at meetings, in reports, and in his yearly televised report to the public.

b. It is recommended that the Superintendent recognize successful innovations in the Departmental newsletter (Na Lono Kula), in his reports to the Board of Education, in his reports to the Legislature, in his briefings to the Governor, and in his reports to the public.

c. It is recommended that the Superintendent further encourage administrative accountability by permitting school decision-making concerning the use of knowledge resources and holding principals responsible for outcomes at their schools.

d. It is recommended that the Superintendent provide general guidance accelerating the use of Elementary and Secondary

Education Act, Title IV funds for adopting and adapting programs that work.

e. It is recommended that the Planning and Evaluation Branch, Office of the Superintendent continue to provide in-kind services to support dissemination services.

f. It is recommended that the Planning and Evaluation Branch, Office of the Superintendent investigate set asides of federal program funds to support dissemination services.

D. Evaluating

The objective of this section is to provide guidelines for evaluating whether or not the Hawaii Educational Dissemination Diffusion System is on course and having an impact on students. The indicator of objective accomplishment is the inclusion in this plan of guidelines for evaluation.

Evaluation may be broadly defined as the collection and use of information to make decisions. More specifically, it is the procedure of relating antecedent conditions and processes to outcomes, and outcomes to objectives and goals. Because there are many types of decisions as well as many types of information, evaluation is a diversified activity and thus no one set of procedures will suffice for all situations. Accordingly, evaluation activities for dissemination and diffusion encompasses three broad areas: 1) monitoring recommendations contained in this plan; 2) monitoring selected statistics in time series; and 3) conducting in-depth evaluations of selected projects.

1. Monitoring Recommendations Contained in this Plan

The intent of monitoring the recommendations contained in this plan is to determine whether or not the Hawaii Educational Dissemination Diffusion System is on course. Accomplishing the recommendations constitutes fulfilling the conceptual agreements among the personnel of the Hawaii Educational Dissemination Diffusion System, the members of the Advisory Council constituted to coordinate dissemination and diffusion activities, the Superintendent of Education in the State of Hawaii, the personnel of the National Institute of Education, and the personnel of the U.S. Office of Education.

2. Monitoring Selected Statistics in Time-Series

Educational efforts have not been characterized by collecting sufficient data to demonstrate educational achievements. Part of the reason for this paucity is reflected in the comments of an exasperated educator who declared that he is bothered by three things: lies, damn lies, and statistics. However, because dependable statistics have not always been collected and presented, opinions have been frequently molded by journalistic impressions. Educational endeavors have often been attacked and defended on the basis of scanty evidence. The collection of the following data constitutes a step toward long-term data collection:

- the number of spread services provided
- the proportion of clients provided spread services
- the number of exchange services provided
- the proportion of clients provided with exchange services
- the number of choice services provided
- the proportion of clients provided with choice services
- the number of implementation services provided
- the proportion of clients provided with implementation services

The time-series paradigm is proposed to assist data arrays and analyses. The data might be displayed by quarterly increments. Discontinuities in the measurements would be indicative of improvements or stress.

Fluctuations of time-series arrays may be classified into four basic elements, which superimposed or acting in concert, account for the changes in the series over a period of time and give the series its irregular appearance. These elements are: secular trends, seasonal variations, cyclical variations, and irregular variations.

A secular trend involves the smooth or irregular movement of a series over a fairly long period of time. Intuitively speaking, the secular trend displays general development or the gradual and persistent pattern of change, such as overall downward (or upward) trend in the proportion of teachers requesting exchange services.

A seasonal variation consists of regular repeating patterns.

Although the name implies a connection with the seasons of the year, it is usually used to indicate any kind of variation which is of a periodic nature, such as an increase of administrators requesting implementation services after receipt of grants.

A cyclical variation is determined by the process of eliminating the secular trend, seasonal variation, and irregular fluctuations. An implementation services data cycle would differ from a seasonal variation inasmuch as it would extend over a longer period of time.

Irregular variations are random fluctuations caused by isolated special events. Innovations, policy changes, and the like might constitute a special event in the normal administration of the Hawaii Educational Dissemination Diffusion System.

Time-series analysis is expected to provide one source of directions for future development. For example, it might suggest that teachers need increasing amounts of exchange services over time. Time-series analysis is also expected to provide information on relationships among the various kinds of linker services. For example, it might disclose that decreases in spread services have no corresponding decreases in exchange services.

3. Conducting In-Depth Evaluation of Selected Projects

A traditional difficulty of evaluating educational endeavors is that available data often measure only superficial aspects of programs. Some objectives are more desirable than others and some objectives are more readily quantifiable than others. Indeed, the objectives deemed most valuable by educators are usually the most elusive to measure. Because of the tremendous pressures to obtain quantifiable measures, a major danger is to neglect or abandon objectives such as teaching creativity, improving interpersonal relationships, and assisting students to accept responsibility for learning. Neglecting these objectives would emphasize the paradox of postulating that important outcomes of education are values and attitudes while appraising only outcomes

of the evidence of knowledge and the power to manipulate knowledge. Thus, it is easy to forego important aspects of education because pressures for evaluation compel concentration on simple or even superficial activities. Thus, in addition to obtaining statistical data on quantifiable objectives, provisions must be made for site visitations, personal observations, and professional judgements. One way of accomplishing this is to conduct "evaluation safaris" where key persons actually visit with teachers and students to gauge the impact of the application of knowledge resources.

In addition to first hand observations, statistical data should also be examined to obtain an indication of the impact of the use of knowledge resources on students. In most cases, it is expected that it will not be feasible to use control groups. The evaluation using achievement data, for example, depends on comparisons between treatment-student scores and national norm-group data collected by the publishers of standardized tests. Project students are compared to a norm group usually comprised of a nationally representative sample of students at the same grade level. The no-treatment expectation is that the project students will maintain, at post-testing, the same achievement status with respect to the norm group as they had at pre-testing. If their post-test scores are higher, the assumption is made that the improvement resulted from the application of the knowledge resource under investigation. Other statistical data such as attendance rates and disciplinary infractions should be compared in time-series.

4. Recommendations

   a. It is recommended that the Project Director of the Hawaii Educational Dissemination Diffusion System provide a yearly evaluation to the Superintendent on the accomplishments concerning the recommendations contained in this plan.

   b. It is recommended that the Project Director of the Hawaii Educational Dissemination Diffusion System include a time-series

analysis in the yearly report to the Superintendent on the following data:

- the number of spread services provided
- the proportion of clients provided spread services
- the number of exchange services provided
- the proportion of clients provided with exchange services
- the number of choice services provided
- the proportion of clients provided with choice services
- the number of implementation services provided
- the proportion of clients provided with implementation services

c. It is recommended that selected in-depth evaluations include site visits as well as the examination of statistical data to determine the impact of knowledge resources.

V. THE EXECUTIVE SUMMARY

The Framework

The first chapter provides the framework of this Plan which includes a brief history of dissemination, the goals of this Plan, and philosophic statements on resources, linkages and leadership.

In 1977, the Department of Education, State of Hawaii, received a special purpose grant ($29,000) from the National Institute of Education. The grant permitted development of this Plan which describes the Hawaii Educational Dissemination Diffusion System. In 1978, the Department received a Facilitator contract ($35,000) to diffuse Educational Programs That Work from the U.S. Office of Education. The Department also received a Capacity Building Grant ($124,955) from the National Institute of Education to assist the implementation of this Plan.

Dissemination involves supplying persons with research and development information and assisting them to use it to improve educational practices. Diffusion involves a more specific effort of making validated Educational Programs That Work available to educators and assisting them to adopt and adapt them.

A major goal of this plan is to foster a common understanding of dissemination and diffusion in Hawaii by describing the Hawaii Educational Diffusion System. Another major goal is to provide recommendations on the components and activities of dissemination and diffusion. Components include: 1) making knowledge resources accessible; 2) providing linkages to the knowledge resources; 3) providing leadership in dissemination and diffusion activities. Dissemination and diffusion activities include: 1) spread, which is the one way casting out of knowledge in all of its forms such as ideas, programs, projects, practices and materials; 2) exchange, which is the two-way or multi-way flow of ideas, programs, projects, practices, and materials as to needs, problems, and potential solutions; 3) choice, which is the facilitation of rational consideration and selection among ideas, programs, projects, practices, and materials from educational research and

development that can be used to improve education; and 4) implementation, which is the adoption and adaption of improvements.

The Resource Component

The second chapter describes the resource component of the Educational Dissemination Diffusion System. The resource component consists of data bases which contain knowledge resources, and consists of services by information brokers and vendors which promote access to data bases. Knowledge resources include ideas contained in journals, programs developed by research centers, exemplary projects developed by local school districts, and materials developed by commercial corporations. Data bases are groupings of knowledge resources such as Psychological Abstracts, and Exceptional Child Education Resources and are made accessible by organizations such as the San Mateo Educational Resources Center, County of San Mateo, California; DIALOG, the Lockheed Missiles and Space Company, Incorporated.

The Special Purpose Grant by the National Institute of Education permitted interviews with a statewide sample of 120 administrators and teachers concerning their needs for knowledge resources. The interviews disclosed that administrators and teachers felt they did not have access to knowledge resources. While the kinds of information needed were varied, it appears that, for the most part, teachers and administrators did not have specific knowledge on obtaining resources. Data bases of relevant resources for improving education were identified.

The selection of services by information brokers and vendors which promote access to data bases was accomplished by examining four services, evaluating alternative ways of making data bases accessible, and selecting a cost-effective mixture of services by brokers and vendors. The four services examined were: 1) ORBIT Search Service, the System Development Corporation; 2) DIALOG Information Retrieval Servies, Lockheed Missiles and Space Company, Incorporated; 3) Library Information Services, Honolulu, Hawaii; and 4) San Mateo

Educational Resources Center, County of San Mateo, Office of Education, California. The three alternative ways of making data bases accessible which were evaluated were: 1) providing access to knowledge resources by contracting all searches for knowledge resources and delivery of resources with the San Mateo Educational Resources Center; 2) providing access to knowledge resources by developing the Department's capability to search for knowledge resources and to deliver resources; and 3) providing access to knowledge resources by combining contractual services with the development of some Department capacity. A mixture of services by brokers and vendors was selected using the cost-effective method; the cost-effective mixture of services which should be combined with development of State capabilities involves using both the San Mateo Educational Resources Center and DIALOG Information Retrieval Services.

Manually accessed data files were then selected. They were: 1) the National Diffusion Network; 2) the programs and products of the Northwest Regional Exchange Educational Materials Collection; and 3) the state system for locating and reporting innovative and exemplary projects and activities in curriculum and instruction.

It was recommended that:

1. A contract be concluded with the San Mateo Educational Resources Center to obtain access to its data bases containing knowledge resources. Such a contract should include provisions for 700 complete searches including delivery of microfiche and/or photocopies of selected references ($14,500) and for training and publications ($2,900).

2. A contract be concluded with the Lockheed Missiles and Space Company, Inc., for access to DIALOG Information Retrieval Services for provisions for 500 searches ($6,000).

3. Educational Resources Information Center materials be purchased to provide quick responses ($15,800).

4. Equipment to duplicate microfiche be purchased ($2,800).

5. The following manually accessed files be made available to persons concerned with improving education in Hawaii: the National Diffusion Network, programs and products in the Northwest Regional Exchange, and promising practices of the State of Hawaii.

6. The following available data bases be vigorously publicized by the linkers of the Hawaii Educational Dissemination Diffusion System:

- Abstracts of Instructional Materials/Abstracts of Research Materials Vocational File
- Agriculture on Line Access
- America: History and Life
- American Statistical Index
- Comprehensive Dissertation Index
- Exceptional Child Education Resources
- Congressional Information Service Index
- ENERGYLINE
- ENVIROLINE
- Educational Resources Information Center
- Foundation Grants Index
- Grants Information System
- Historical Abstracts
- Language and Language Behavior Abstracts
- Management Contents Data Base
- Child Abuse and Neglect
- National Information Center for Educational Media
- National Information Center for Special Education Materials/National Instructional Materials Information System I
- National Technical Information Service
- Psychological Abstracts
- Sociological Abstracts
- Social Scisearch
- National Diffusion Network
- San Mateo Educational Resources Center
- Programs and Products in the Northwest Regional Exchange Educational Materials Collection
- Clearinghouses
- A System for Locating and Reporting Innovative and Exemplary Programs, Projects and Activities in Curriculum and Instruction, State of Hawaii.

The Linkage Component

The third chapter describes the linkage component of the Hawaii Educational Dissemination Diffusion System. Generally, linkage is the connection between knowledge resources and persons who could benefit by using them; it involves stimulating the need for knowledge, obtaining knowledge resources, assisting in the use of resources, and providing exchanges of information between the knowledge producers and knowledge users. More specifically as used in this Plan, linkers are persons who: 1) possess personal attributes which support linker services; 2) have relevant knowledge necessary to provide linker services; and 3) provide linker services in the organizational context of Hawaii.

Personal attributes desired of linkers were obtained by examining suggestions by scholars who have studied the subject and selecting those felt necessary for Hawaii. The attributes selected were: being candid and tactful, being clear and tolerant of ambiguity, being able to make proposals and appreciating other points of view, being logical with a flexible orientation to problem solving, being cooperative and self-directed, being enthusiastic without going overboard, being serious with a sense of humor, having pride in one's work and low ego needs, being task oriented and patient, being supportive and discriminative, being able to analyze and synthesize creatively, and having perseverance and the judgement to disengage when it is the best course of action.

Knowledge necessary to provide linker services was identified as understanding the assumptions and advantages of the various change models, acquiring general skills, and acquiring specific skills. The assumptions and advantages of change models were briefly presented to provide considerations for actions. General skills necessary for linker services were identified as listening skills, analysis skills, synthesis skills, communication skills, conflict management skills, and inter-personal skills. Specific skills necessary for linker services were organized in accord with the activities of dissemination and diffusion and are:

Spread skills are associated with the one way casting out of knowledge in all its forms such as information, products, ideas, and materials:

. Provide general information on knowledge resources through brochures and packets in formats, styles, and languages suitable to all clients
. Provide information on specific products which may be useful to specific clients
. Provide comparative information on different products
. Demonstrate products or practices
. Conduct awareness conferences
. Promote and advertise products, services, and practices

Exchange skills are associated with two-way or multi-way flow of information, products, ideas, and materials as to needs, problems, and potential solutions:

. Negotiate information searches requested by clients
. Search for information requested by clients
. Connect clients to knowledge sources or access points
. Deliver search results to clients
. Conduct needs sensing activities to discern future client needs
. Transmit client needs and suggestions to researchers and developers
. Conduct conferences where developer/demonstrators can exchange information with clients

Choice skills are associated with assisting rational considerations and selection among information, products, ideas, and materials from educational research and development that can be used to improve education.

. Arrange for site visitation
. Tailor resources from specific clients
. Assist in stating problems
. Assist in stating objectives
. Assist in examining alternatives
. Evaluate products according to criteria relevant to clients such as validity, reliability, practicability, costs and benefits
. Summarize resources
. Synthesize diverse resources
. Assist in formulating recommendations

Implementation skills are associated with the adoption and adaption of improvements:

. Assist in in-service training
. Assist in adopting improvements
. Assist in finding long-term financial support
. Assist in evaluating
. Assist in adapting improvements
. Assist in developing policies, regulations, and procedures which foster the continuation of improvements

Providing linker services in the organizational context of Hawaii involved delineating linker service objectives and delivery of services. Linker service objectives were set after scrutinizing pilot services during a six-month period and were set at:

Services	Number of Clients Served	Percent
Spread Services	12,000	100
Exchange Services	1,200	10
Choice Services	240	2
Implementation Services	120	1

Delivery of services involves hiring four linkers and housing them in the office of the Superintendent; this approach has the advantage of reasonable costs, visibility of services, and expediting responses for services.

This chapter recommends that:

1. The following personal attributes be used as guides in selecting linkers:

   . Being candid and tactful
   . Being clear and tolerant of ambiguity
   . Being able to make proposals and appreciating other points of view
   . Being logical with a flexible orientation to problem solving
   . Being cooperative and self-directed
   . Being enthusiastic without going overboard
   . Being serious and having a sense of humor
   . Having pride in one's work and low ego needs
   . Being task oriented and patient
   . Being supportive and discriminative
   . Being able to analyze and synthesize creatively
   . Having perseverance and the judgement to disengage when discontinuance is the best course

2. The personal attributes be shared with interviewing committees convened for the purpose of selecting linkers for the Hawaii Educational Dissemination Diffusion System.

3. The personal attributes be used by the Project Director of the Hawaii Educational Dissemination Diffusion System in appraising linkers in the yearly evaluation process.

4. Hawaii's linkers consider the assumptions and advantages of change models, their personal preferences and skills, the preferences of and skills of clients, and the time and resources available to them when providing services.

5. Hawaii's linkers use the list of skills in this Plan as guides as to services expected of them.

6. The Project Director of the Hawaii Educational Dissemination Diffusion System arrange to have instruction conducted during the first project year for the items under "staff development needs" in this plan.

7. The Project Director of the Hawaii Educational Dissemination Diffusion System conduct yearly appraisals of staff development needs and arrange for instruction to meet needs.

8. The tentative yearly linker services objectives be set at:

Services	Number of Clients Served	Percent
Spread	12,000	100
Exchange	1,200	10
Choice	240	2
Implementation	120	1

9. Linkers keep logs of services reflecting spread, exchange, choice, and implementation services.

10. The Hawaii Educational Dissemination Diffusion System Project Director submit quarterly reports to District Superintendents on linker services provided to their personnel.

11. The Project Director of the Hawaii Educational Dissemination Diffusion System analyze linker services on a yearly basis and set realistic objectives; annual services and objectives for the next year should be included in the annual report to the Superintendent.

12. Four linkers, a secretary and a half-time librarian be hired and housed in the Planning Services Section of the Office of the Superintendent.

The Leadership Component

The third chapter describes the leadership component of the Hawaii Educational Dissemination Diffusion System. Leadership relevant to dissemination and diffusion was discussed as: 1) planning, 2) supporting, and 3) evaluating.

The concepts which guided planning involved setting objectives, providing indicators which assist in determining whether or not objectives were accomplished, making recommendations, and providing costs for implementing recommendations. Another important concept which guided the development of this Plan was coordination among state agencies engaged in dissemination activities.

Supporting actions which promote the use of knowledge resources to improve educational practices involved creating a supportive environment and providing financial support. A supportive environment was deemed necessary if changes to improve education are to be effectively implemented and sustained. Creating a supportive environment included making encouraging statements to educational practitioners in support of change, giving legitimacy to using knowledge resources, providing principals with increased control, and encouraging participative management. Providing financial support involves sustaining in-kind services and arranging for future funding.

Evaluating encompasses: 1) monitoring recommendations contained in this plan; 2) monitoring selected statistics in time-series; and 3) conducting in-depth evaluations of selected projects. Monitoring recommendations involves determining whether or not the Hawaii

Educational Dissemination Diffusion System is on course. Monitoring selected statistics permits discerning trends and relationships among data. Conducting in-depth evaluations assists in assessing achievement of not readily qualifiable objectives and assessing the impact of knowledge resources on students.

This chapter recommends that:

1. An Advisory Council be convened of persons representing agencies involved with dissemination activities. Such a network might include:

   . The University of Hawaii Library System
   . The Hawaii Newspaper Agency
   . The Office of Instructional Services, Department of Education
   . The Office of Library Services, Department of Education
   . District Offices, Department of Education
   . Public Schools, Department of Education
   . Teachers, Department of Education
   . The Hawaii Association of Independent Schools
   . The Legislative Reference Bureau
   . Curriculum Resources Development Group, University of Hawaii
   . Department of Curriculum and Instruction, University of Hawaii
   . The Hawaii Institute for Management and Analysis in Government

2. This plan be periodically updated.

3. The Superintendent express support for use of knowledge resources in improving education at meetings, in reports, and in his yearly televised report to the public.

4. The Superintendent recognize successful innovations in the Department newsletter (Na Lono Kula), in his reports to to the Legislature, in his briefings to the Governor, and in his reports to the public.

5. The Superintendent further encourage administrative accountability by permitting school decision-making concerning the use of knowledge resources and holding principals responsible for outcomes at their schools.

6. The Superintendent provide general guidance accelerating the use of Elementary and Secondary Education Act, Title IV funds for adopting and adapting programs that work.

7. The Planning and Evaluation Branch, Office of the Superintendent continue to provide in-kind services to support dissemination services.

8. The Planning and Evaluation Branch, Office of the Superintendent investigate set asides of federal program funds to support dissemination services.

9. The Project Director of the Hawaii Educational Dissemination Diffusion System provide a yearly evaluation to the Superintendent on the accomplishments of the recommendations of this Plan.

10. The Project Director of the Hawaii Educational Dissemination Diffusion System include a time-series analysis of the following data in the yearly report to the Superintendent:

    . the number of spread services provided
    . the proportion of clients provided spread services
    . the number of exchange services provided
    . the proportion of clients provided with exchange services
    . the number of choice services provided
    . the proportion of clients provided with choice services
    . the number of implementation services provided
    . the proportion of clients provided with implementation services

11. In-depth evaluations include site visits as well as the examination of statistical data to determine the impact of knowledge resources.

VI. BIBLIOGRAPHY

Berman, Paul, and Milbrey Wallin McLaughlin. Federal Programs Supporting Educational Change, Vol. VIII, Implementing and Sustaining Innovations. Santa Monica, California: Rand Corporation, 1978.

Bina, James V., John C. Peterson, and Ida Marie Halasz. Databases and Clearinghouses; Information Resources for Education. Columbus, Ohio: The Ohio State University, 1978.

Bruett, Mary Jo, and others. Iowa Network for Obtaining Resource Materials for Schools (INFORMS). Educational Resources Information Center, ERIC Document ED 069 305, 1972.

Coulson, John M. "Theoretical Antecedents of the Knowledge Dissemination and Utilization Tradition." Viewpoints in Teaching and Learning. Indiana University: Journal of the School of Education, 1978.

Crandall, David P. Training and Supporting Linking Agents. Educational Resources Information Center, ERIC Document ED 141 902, 1977.

Culbertson, Jack. A Nationwide Training System for Linking Agents in Education. Columbus, Ohio: University Council for Educational Administration, 1977.

Duncan, Claire W. The Director of Linking Agents: Providing Management and Support. Educational Resources Information Center, ERIC Document ED 151 331, 1978.

Emrick, John A., and Susan M. Peterson. A Synthesis of Findings Across Five Recent Studies of Educational Dissemination and Change. San Francisco: Far West Laboratory, 1977.

Farr, Richard S. Knowledge Linkers and the Flow of Educational Information. Educational Resources Information Center, ERIC Document ED 032 438, 1969.

Fletcher, Jerry L., and others. Final Report of the Dissemination Analysis Group to the Dissemination Policy Council. 1977

Havelock, R.G. Planning for Innovation Through Dissemination and Utilization of Knowledge. Ann Arbor, Michigan: Institute for Social Research, the University of Michigan, 1969.

_____., and D.A. Lingwood. R & D Utilization Strategies and Functions: An Analytic Comparison of Four Systems. Ann Arbor, Michigan: Institute for Social Research, The University of Michigan, 1973.

_____., and Mary C. Havelock. Preparing Knowledge Linking Change Agents in Education: A Materials and Training Development Project. Educational Resources Information Center, ERIC Document ED 056 257, 1971.

Herlig, Richard K. Linker Training Processes for the State Education Agency Dissemination System. Educational Resources Information Center, ERIC Document ED 143 335, 1977.

Hood, Paul D., and Carolyn S. Cates. Alternative Approaches to Analyzing Dissemination and Linkage Roles and Functions. San Francisco: Far West Laboratory for Educational Research and Development, 1978.

Hull, William L., and Gregory Benson, Jr. Installing a Coordinated Information Network in a State Education Agency: A Case Study of the Decision Process in New York. Educational Resources Information Center, ERIC Document ED 061 428, 1972.

Louis, Karen Seashore. "Dissemination of Information from Centralized Bureaucracies to Local Schools: The Role of the Linking Agent," Human Relations, Volume 30, No. 1 (1977), 25-42.

Nash, Nicholas, and Jack Culbertson, eds. Linking Processes in Educational Improvement: Concepts and Applications. Educational Resources Information Center, ERIC Document ED 141 897, 1977.

National Institute of Education, Department of Health, Education, and Welfare. Request for OMB Clearance with Supporting Documents for the Evaluation of the State Capacity Building Program in Dissemination. Durham, North Carolina: National Testing Service Research Corporation, 1978.

Ogden, Evelyn, and Marilyn Musumeci. A Taxonomy of Technical Assistance Skills. Rochelle Park, New Jersey: CAPLA Associates, Inc., 1977.

Parish, Ralph. A Report on Facilitating Educational Change with Local School Districts Through the National Diffusion Network. Educational Resources Information Center, ERIC Document ED 144 559.

Piele, Philip K. Review and Analysis of the Role, Activities, and Training of Educational Linking Agents. Educational Resources Information Center, ERIC Document ED 128, 861, 1975.

Rosenau, Fred S. Career Development Opportunities for Educational Linking Agents. San Francisco: Far West Laboratory for Educational Research and Development, 1977.

Spiney, Richard, and others. Report and Recommendations: Interstate Project on Dissemination. Washington, D.C.: National Institute of Education, 1976.